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TRANSACTIONS & STUDIES

of

The College of Physicians of Philadelphia

Volume 36

(Fourth Series)

Number 1

(July 1968)

A Notable College Anniversary: 175th Birthday of the *Transactions & Studies*

With this issue, the Transactions & Studies of The College of Physicians of Philadelphia *celebrates its 175th birthday. The title page of Volume I bears the date 1793, while the preface is dated more exactly July 5th, 1793.*

"Medical Communications," announced the editors in the preface, "have been generally found to be amongst the most certain and extensive means of improving the practice of physic. We therefore offer the present work as a pledge *to our medical brethren that we shall publish as often as materials are afforded."*

The editors aimed to provide "the most faithful Register of Diseases which could be procured." A most important objective was to promote the development of an American Pharmacopoeia. Also, accounts of epidemics and other uncommon disorders, the editors believed, would be of assistance to practitioners. The preface to the first volume was written by Drs. Benjamin Rush, William Shippen, Jr., and Samuel Powel Griffitts.

Consideration of the journal's longevity must take into account a hiatus in publication between 1793 and 1841, as well as a few brief lapses thereafter until 1887, the centenary of the College's founding, when the fourth series of the Transactions & Studies *was instituted. Since then there have been some changes in format and in the number of issues per year, but no actual lapses in publication. This may be regarded as a creditable record, particularly in view of the fact that management of the journal has throughout its evolution been in the hands of busy Fellows of the College or members of the administrative staff, all serving gratuitously.*

The journal was started five years after the founding of the College, when its first President, John Redman—its "aged and humble servant," to use his own words—was still its President. The Vice-President was William Shippen, Jr.; the Secretary, Samuel Powel Griffitts; the Treasurer, Benjamin Say. Redman and Shippen had been among the founding Senior Fellows; Griffitts and Say were among the founding Junior Fellows.

The Committee on Publication was elected in May, 1793, and consisted of the following: Andrew Ross, Caspar Wistar, Jr., Samuel Powel Griffitts,

Michael Leib, William Currie, John H. Gibbons, Benjamin Rush and William Shippen, Jr. "The first three," according to W. S. W. Ruschenberger, M.D., the College's major historian, "were to prepare the 'copy,' the second three to superintend the publication, and Drs. Rush, Shippen and Griffitts to write a preface." Only Redman, Rush and Shippen had been among the founding Senior Fellows. The first volume of the Transactions *was, therefore, apparently largely the product of young endeavor, and it is gratifying to note on this 175th anniversary that in the last decade or so younger Fellows have been responsible for its publication.*

The more formidable the anniversary, the more interesting and instructive is a retrospective view. A commemorative view of this sort is embodied in this issue of the Transactions & Studies *in the form of a photoreproduction of the title page of the germinal issue and of a reprint of its Table of Contents.**

The Editors

W. B. McDaniel, 2d, 1938–54
(Acting Editor, 1934–38)
Fred B. Rogers, 1956–66
Robert Erwin Jones, 1966–68

TRANSACTIONS

OF

THE COLLEGE OF PHYSICIANS OF PHILADELPHIA

Volume 1. Part 1. 1793

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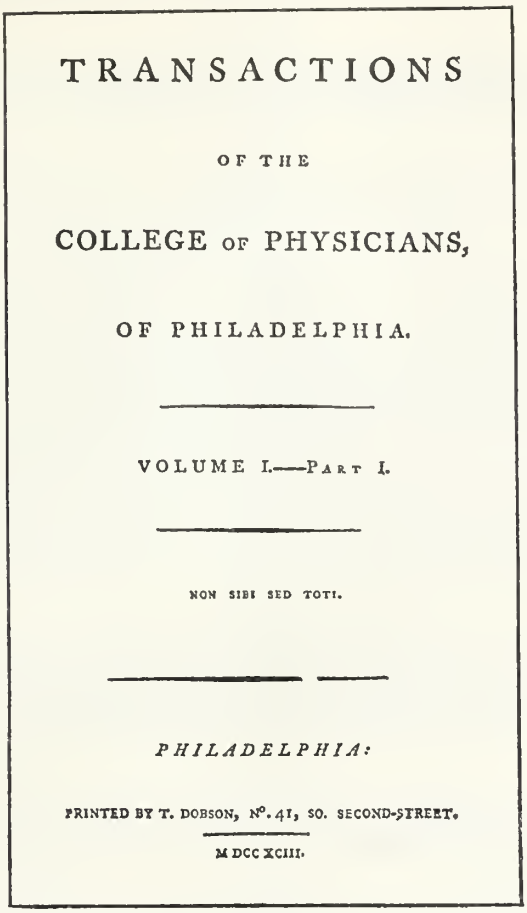
* Trans. & Stud. Coll. Phys. Phila., 4th s., vol. 4, Suppl., 1937, pp. [12–15].



TRANSACTIONS

OF THE

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OF PHILADELPHIA.

VOLUME I.—PART I.

NON SIBI SED TOTI.

PHILADELPHIA:

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M DCC XCIII.

FIG. 1. The title page of Volume I, Part 1, dated 1793, of the *Transactions & Studies of The College of Physicians of Philadelphia.*

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Environment, Behavior and Disease: Observations and Experiments at the Philadelphia Zoological Garden[1]

By HERBERT L. RATCLIFFE, SC.D.[2]

YOUR invitation to the Benjamin Musser Lectureship for 1967 is, in its truest sense, a memorial to two distinguished, but now deceased, Fellows of this venerable institution: Charles B. Penrose and Herbert Fox. This lecture is offered in their honor, for my work is based on foundations that were built by them.

The Penrose Laboratory of the Zoological Society of Philadelphia, so named some 10 years after the death of Dr. Penrose in 1925, is a measure of these men. This laboratory is unique in age and function, in the nature and volume of its records and in its output of published works. Its records include the results of post-mortem studies of all mammals and birds and of many reptiles and amphibians that have lived and died in the Philadelphia Zoo since November 1901. This unbroken series presently represents more than 20,000 individuals, including about 6,000 mammals, 12,000 birds and 2,000 reptiles and amphibians.

As conceived by Dr. Penrose and developed by Dr. Fox and his associates, a primary purpose of this laboratory has been (and is) to determine the causes of disease and death among animals on exhibition in the Philadelphia Zoo and so develop methods of prevention and control (1–5). This is the first laboratory so designed for any zoo and, until recently, the only one. Few have attempted to duplicate it either in North America or in Europe. Its successes and failures are clearly evident in its records which have always been open to the qualified. The questions, "Why do they die?" and "How can they live so long?" are as valid in 1967 as they may have been in 1901. Answers have perhaps improved with time (6).

A zoo is an experiment in which animals of many species are assembled into an environment that corresponds most closely to densely populated urban areas. As a rule these animals are purchased as infants or juveniles and mature after intervals that depend upon the species and age on arrival in the zoo. Zoo animals generally are, therefore, more or less unlearned in behavior patterns characteristic of the species. In addition, close contact with man and the other novel stimuli of the zoo environment may induce further confusion in behavior. These factors suggest that zoo animals should be considered disorganized populations. Thus, attempts to relate diseases of these animals to behavior and environment are confronted by complex variables, some of which will be defined rather broadly.

Environment may be understood in part as the sum of external and internal forces that encompass organisms as individuals, or as colonies, populations or species. And organisms are self-regulating, self-perpetuating physicochemical entities, which, in health, maintain dynamic equilibrium with

[1] Benjamin Musser Lecture X, The College of Physicians of Philadelphia, 4 December 1967. This work has been supported in part by grants from the National Heart Institute (HE-01979), the Smith, Kline and French Foundation and the World Health Organization.

[2] Director, Penrose Research Laboratory, Zoological Society of Philadelphia, 34th Street and Girard Avenue, Philadelphia, Pennsylvania 19104; Professor of Comparative Pathology, University of Pennsylvania.

environment through neural and neuromuscular responses that constitute behavior. Disease represents loss of dynamic equilibrium with environment and must of course involve behavior or behavior patterns (7–11).

Behavior and behavior patterns are the products of evolution through natural selection for adaptations that ensure survival, provided environmental changes are not too rapid or severe. Behavior patterns also are more or less species-specific and usually include interspecific and intraspecific responses. Interspecific responses are evident chiefly in prey-predator relationships. Intraspecific responses maintain the species through selection, reproduction and dispersion, but also include factors that limit population density considerably below the capacity of native environments (12–14). These factors operate at least in part through endocrine mechanisms to reduce fecundity, the percentages of offspring that survive and the mean age at death and must, therefore, contribute to disease.

Major features of the zoo environment are housing, food and the many creatures with which each animal must interact: cage mates, animals in nearby cages, keepers, visitors and parasitic agents (bacteria, fungi and yeasts, animal organisms and viruses). Some parasites apparently persist latent in their hosts until such time as resistance is depressed, and then induce disease.

Housing in the Philadelphia Zoo since 1901 has changed at wide intervals. Changes always have attempted to provide greater space for animals in brighter cages where sanitation is more readily maintained.

Animal Diets

The records of the Penrose Laboratory from 1901 through September or October 1935 document disease in animals that were fed the traditional and often inadequate diets then common to zoological gardens. During 1935 diets for all animals that accept composite rations (mammals, birds and reptiles) were revised to exceed probable nutritional requirements as indicated by information then available (15). These diets have been highly successful both in terms of acceptance and in the quality of nutrients supplied. Subsequent progress in nutrition and subsequent evidence of disease have not indicated needs for essential changes in the formulae (16). Thus, for upwards of thirty years the populations of the Philadelphia Zoo have been maintained on diets of high quality and fixed composition, prepared under supervision in the zoo. Animals not on these diets, e.g., sea lions, will not be considered here.

Thus, since 1936, or 1937 at the latest, the records of the Penrose Laboratory to be reviewed document disease in better than adequately nourished populations on highly constant diets of high quality. Disease in these populations, therefore, represents loss of dynamic equilibrium with features of the zoo environment other than food.

Nutritional disease, as commonly defined, has, of course, been controlled completely among mammals and birds of this zoo since 1936. At the same time, intestinal nematodes, protozoa and other enteric pathogens were rapidly reduced as causes of disease and death (6). I suggest, therefore, that these responses provide the necessarily stringent criteria for measuring effective levels of nutrition. Diets should not be judged solely by their support of growth, development and reproduction. Diets also should induce and maintain effective levels of resistance to parasitic organisms.

The influence of these diets upon resistance to parasitic organisms in this zoo is well illustrated by records for tuberculosis among birds of four orders, all of which develop unmistakable lesions (17). These are ducks, geese and swans (Anseriformes), doves and pigeons (Columbiformes), pheasants, quail and guans (Galliformes), and parrots, cockatoos and macaws (Psittaci-

formes). About 50 per cent of the bird population of this zoo have been representatives of these groups throughout the period of this study.

Table 1 summarizes briefly the records for birds of these four orders, listing total deaths, deaths with tuberculosis and tuberculosis proportionate mortality (TPM), i.e., the percentage found to have tuberculosis. Records are given as totals for each of four decades beginning with 1916 and for a final period of 12 years ending with 1967.

This summary shows, first, an increased percentage with tuberculosis (22.3 vs. 10.9) during the second decade (1926–1935), accompanied by a decrease in total deaths. Decrease in total deaths for this period reflects decreased purchases of birds for the zoo exhibits, which was one result of reduced income that accompanied economic difficulties after 1929. The increased mortality (numbers and per cent) from tuberculosis is not readily explained. It may, however, reflect an effect of the inferior quality of foods that were purchased when economic conditions worsened.

Reduced numbers of purchases for exhibition continued through 1945, accompanied by a reduction in the percentage of deaths with tuberculosis to about the value for the period from 1916 to 1926. Thereafter, however, purchases have been increased, and, for ducks and geese especially, populations have exceeded considerably the numbers for earlier periods. Nevertheless, the percentage with tuberculosis has continued to decrease. In fact, tuberculosis has not been found at death in birds of the orders Galliformes or Psittaciformes during the terminal 12 years of this review. This is unique in the history of this zoo.

TABLE 1

Total Deaths, Deaths with Tuberculosis and Tuberculosis Proportionate Mortality (TPM) for Birds of Four Orders (See Text) during a Period of 52 Years, 20 Years before and 32 Years after Diets Were Improved in 1935.

Periods	Deaths	Deaths with Tbc	TPM
1916–1925	975	107	10.9
1926–1935	774	166	22.3
1936–1945	590	57	9.6
1946–1955	576	31	5.4
1956–1967	1152	35	3.0

Social Factors

Two opposing environmental factors are believed to have influenced the changing frequency of tuberculosis shown in Table 1. The first has been improved nutrition, especially quality and quantity of dietary protein. This assumption has been confirmed by adequate experiments (18, 19). The second is less readily defined. It apparently reflects the effects of endocrine responses to social factors and behavior among animals of confined populations (12, 14).

For example, the numbers of birds of the order Anseriformes were increased from a total of about 200 in 1946 to about 800 in 1965 without appreciable increases in exhibition areas. Nevertheless, one may question the validity of attempting to define this change merely in terms of "population density." Increased numbers of Anseriformes in this instance have been more a matter of increasing the number of species represented than the representation of any one species. Space allowances per bird have lessened, certainly, but space allowances have never justified the term "crowding."

Instead, the aim has been to have each species represented by an adult male and one or more adult females. This is the crucial factor. The collection of Anseriformes in this zoo has been composed largely of breeding pairs or breeding groups for upwards of 20 years. These birds are limited to an annual breeding season of about four months, during which each species has attempted more or less aggressively to establish a nesting site. Aggressiveness and, with it, the size of nesting sites that are needed to prevent or reduce conflicts will differ with the species. Still,

these birds are confined and total space is limited. Thus, the breeding season is inevitably a period of more or less intense behavioral interactions, which may be assumed to reduce levels of resistance to tuberculosis by stimulating increased secretion of ACTH and adrenal steroids (12, 14). This opinion also is supported by the observations on the social factors that have been most often associated with deaths of birds and mammals in this zoo from toxoplasmosis and from virus hepatitis (20). Similarly, the frequency of amyloidosis, especially among anserine birds, apparently reflects behavioral responses to the zoo environment (21). In this instance, amyloidosis has occurred most often in birds of limited geographic distribution which apparently adapt less readily than other species to the social situations of this zoo. Incidentally, amyloidosis of these birds is rarely associated with tuberculosis or with other infectious diseases.

Behavioral responses to social situations were first recognized as probable causes of changing patterns of disease among animals of this zoo during 1950, approximately (22). I mentioned earlier that about three years prior to this date the Philadelphia Zoo had begun attempts to develop a collection in which a majority of species would be represented by a male and one or more females. The increased numbers of ducks, geese and swans (Anseriformes) were part of this program. However, total numbers of mammals on exhibit were not increased significantly. Nevertheless, this program has caused profound changes in the social components of the zoo environment for many species of mammals as well as for the Anseriformes.

Relatively few species of mammals are naturally gregarious, and few gregarious mammals tolerate excess males. Even fewer maintain the continuous male-female and parent-offspring associations that have characterized the mammal collections of this zoo during recent decades.

Figure 1 illustrates some of the effects of continuous male-female and parent-offspring associations upon a non-gregarious species. The animals shown here are whitetail deer (*Odocoileus virginianus*) photographed during June 1967 when antlers were approaching maturity but were still covered by modified skin, "velvet," and obviously deformed. Antlers of the larger male, about three years of age at this time, also were deformed in 1966.

This photograph also shows that all of these animals were emaciated, and that the abdomen of one of the females on the left (head down) was distended. This was a common characteristic and usually accompanied by intermittent diarrhea. These animals were all adults when photographed, but sizes ranged from 25 to 50 per cent less than is to be expected of the species either in sparse populations of free-ranging animals in Pennsylvania or as breeding males and females maintained at Pennsylvania State University on a diet that corresponds to the diet used in this zoo. At Pennsylvania State University, however, males have been penned with females only during the brief annual breeding period, and fawns are separated from females at weaning (23).

The deer shown in Figure 1 are part of a group that was started four years earlier with three females and a male. Each female produced twins the following year, but only one pair of twins developed at about the expected rate. Others were more or less dwarfed. Subsequent offspring were increasingly inferior, and reproduction for 1967 failed completely.

Pronounced hypertrophy of the adrenal cortex has been a common feature of animals that died from this group, which is in keeping with the well-known effects of behavioral interactions in confined populations (12–14). Abnormal levels of adrenal cortical steroids also could explain the debilitated state of these animals. Deformed antlers, with excess tine formation, may also be attributed to behavioral

FIG. 1. Adult male and female white-tail deer (*Odocoileus virginianus*). June 1967. Deformed antlers (castration effect) and wasting and distended abdomens are attributed to adrenal cortical hyperfunction and pituitary exhaustion in response to increasing group size.

responses, which may have exhausted pituitary function or so increased the output of ACTH that secretion of other pituitary hormones was more or less inhibited. Whatever the actual mechanism, both males and females in this group were dwarfed. Thus, the response of these deer to increasing group size apparently has corresponded to the reported responses of children to adverse social environments (21, 25). Dwarfing in these children was associated with pituitary hypofunction, and growth was renewed when environment was improved. The physical appearance of these deer also improved rapidly after the group had been reduced by about 65 per cent, although all were too old for renewed growth.

Behavior and Cardio-Vascular Disease

A changing social environment of recent decades has also been associated with more generalized shifts in frequencies of disease. For example, deaths of mammals that might be attributed to ischemic necrosis of the myocardium were unknown in this animal collection prior to 1949. But, within the five year period from 1959 through 1963, this lesion was found in upwards of 20 per cent of deaths of all mammals. Figure 2 illustrates the changing frequency of stenosis of the intramural coronary arteries, myocardial fibrosis, myocardial necrosis and aortic atherosclerosis among mammals of eight families the representatives of which have accounted for about 70 per cent of this collection from 1939 through 1967. Records for this period are divided into five intervals of five years each and a terminal period of four years. Frequencies are shown as percentages found during post-mortem examinations.

This series of eight families includes anthropoid apes, Old World monkeys and baboons, New World monkeys, canids, felids, mustelids, bovids and kangaroos, i.e., omnivores, carnivores, and herbivores.

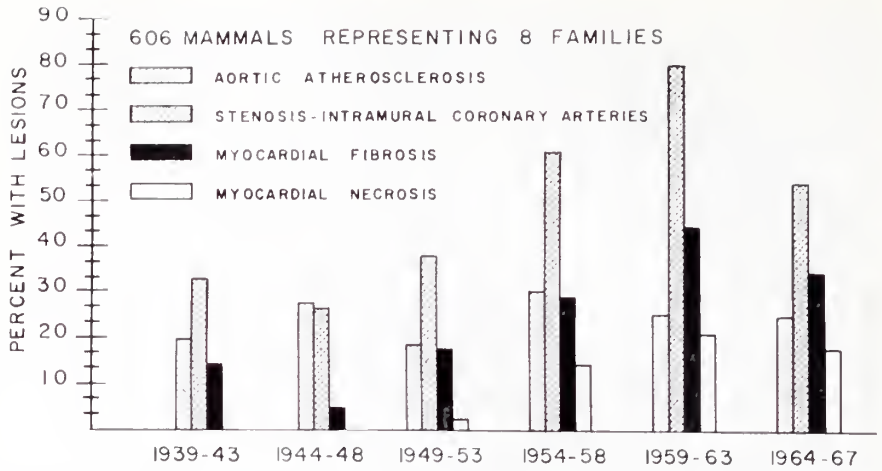

FIG. 2. Changing frequencies of cardiovascular lesions in mammals of the Philadelphia Zoological Garden. Increased frequency of coronary stenosis and associated lesions are attributed to a changing social environment.

Diets for these animals had not been changed significantly since 1935 (16). The contributions of each of these groups have not been sufficiently distinct to warrant comment, and males have been affected about as often as females.

The records shown in Figure 2 indicate that aortic atherosclerosis has developed independently of arteriosclerotic stenosis of the intramural coronary arteries in this series. Aortic lesions were found in from less than 20 per cent to about 30 per cent of these animals. These fluctuations probably have depended upon mean age at death.

The frequencies of coronary stenosis and myocardial fibrosis from 1939 through 1948 also lack distinctive patterns, and examples of myocardial necrosis were not recognized prior to 1949. During the following period of fifteen years, however, the frequency of each of these lesions has increased at a highly constant rate. Then, from 1964 through 1967, each has decreased in approximately equal proportions, a fact which possibly reflects improved management. Observations must be continued through 1973 to determine the significance of this change.

The greater frequency of coronary stenosis in this series signifies only that all examples of the lesion found in sections of myocardium, whatever the grade, were recorded. However, all examples of myocardial fibrosis and myocardial necrosis have been associated with advanced grades of coronary stenosis. The highly constant frequency relationships of these lesions are taken to indicate that myocardial fibrosis and necrosis in this series have depended on ischemia. The greater frequency of fibrosis is to be expected since small or isolated lesions would not often be severely damaging. Myocardial necrosis and fibrosis of toxoplasmosis and other infections of the heart have been readily distinguished from the lesions recorded in Figure 2 (26–28).

Improved diets for these animals after 1935 may be assumed to have increased longevity. Increased mean age at death could account to some degree for the changing frequencies of cardiovascular disease shown in Figure 2. However, this suggestion is not fully supported by the analysis of these records that is contained in Figure 3. In this chart the records shown in Figure 2 have been rearranged according to age at death, with age at death expressed as "quarters of life." This sys-

tem has taken the maximum age at death for animals of each of the eight families, minus 12 months to eliminate deaths within this period, and divided these values into four equal parts or quarters. Then, deaths and lesions in any quarter of longevity for animals of any one family might be equated with deaths and lesions of the corresponding quarter for animals of other families (29).

Figure 3 shows that the frequency of aortic atherosclerosis increased about fourfold from quarter I to quarter IV in this series. Coronary stenosis and myocardial fibrosis also increased in frequency with age. However, the increase in these lesions between quarters I and IV was only about twofold, and myocardial necrosis occurred with equal frequency in each quarter.

The changing frequency of coronary disease and associated lesions has been attributed to behavioral responses in a changing social environment. This hypothesis has now been tested successfully in experiments with chickens and swine. Preliminary studies on the chickens found that arteriosclerotic stenosis of the intramural coronary arteries may begin development before sexual maturity and that its rates of development might be expressed numerically as "heart-scores." Thus, the progress of intramural coronary stenosis could be related to duration and intensity of stimuli, i.e., to longevity in defined social situations.

Figure 4 illustrates the progress of coronary arterial stenosis measured by this method in male and female chickens that had been assigned randomly at age seven weeks to one of four social situations. The space allowed each bird was the same in all situations. Food and water were supplied *ad libitum*. These birds were killed for study at stated intervals through 51 weeks.

This experiment demonstrated that rates of progress of stenosing lesions of the intramural coronary arteries as measured by the heart-score method are, indeed, related to sex and social situation, i.e., to behavior. In separated females for which ovulation was the only major activity, coronary stenosis developed more slowly than in males in any situation. However, values for separated females were not significantly less ($p < 0.05$) than values for females of pairs and groups. Further, values for paired and grouped females were not significantly less than for males of the smaller group, which, in turn, overlapped the heart-scores for males of the pairs and larger groups. Separated males, exposed as they were to auditory and visual stimuli from pairs and groups in nearby cages, without opportunity to participate, developed stenosing lesions of the intramural coronary arteries at a significantly more rapid rate ($p < 0.05$) than males in other situations (30).

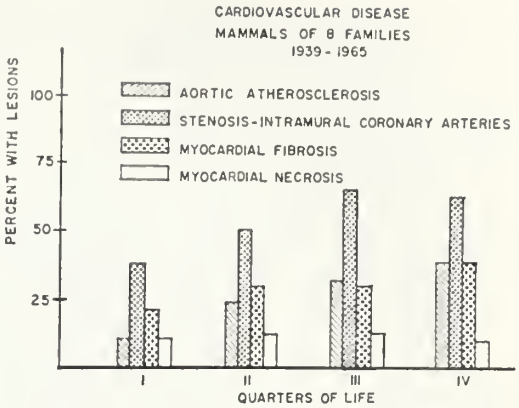

FIG. 3. Frequency of cardiovascular lesions as related to longevity of mammals of the Philadelphia Zoological Garden.

None of the birds in this experiment died with myocardial necrosis. However, two grouped males, one paired male and a separated male had developed small foci of myocardial necrosis and fibrosis. At the same time, experience with chickens grouped with disproportionate numbers of males suggested the experiment outlined in Table II.

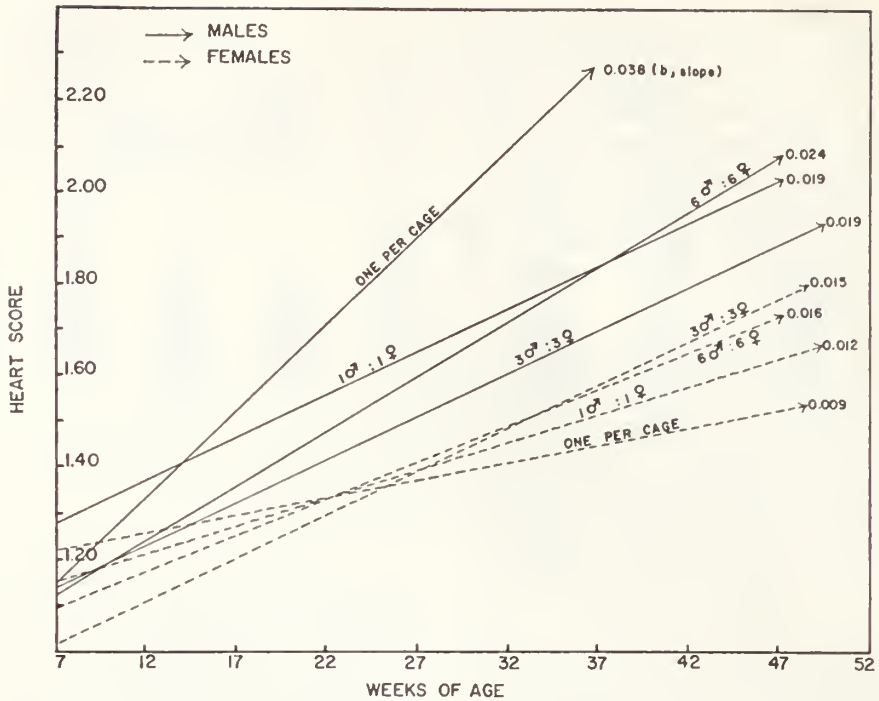

FIG. 4. Linear regressions of "heart-scores" (severity of coronary stenosis) on age as related to social situations. Rates of progress in males held one/cage were significantly higher than in males in other situations. Rates for grouped and paired females equaled rates for males of the smaller groups (Ratcliffe, H. L. and Snyder, R. L.: Circulation Res. 17: 403, 1964).

TABLE II

NUMBER AND SEX OF CHICKENS IN EACH OF SIX SOCIAL SITUATIONS WITH AND WITHOUT DIAZEPAM. DEATHS FROM ALL CAUSES AND WITH MYOCARDIAL NECROSIS TO AGE 45 WEEKS.

Number of Cages	Number and Sex Per Cage		Flock I—No Diazepam				Flock II—0.04% Diazepam			
			All causes		Necrosis		All causes		Necrosis	
	♂♂	♀♀	♂♂	♀♀	♂♂	♀♀	♂♂	♀♀	♂♂	♀♀
32	1	0	2	—	0	—	1	—	0	—
32	0	1	—	0	—	0	0	1	—	0
32	1	1	8	2	3	0	7	1	3	1
8	4	0	2	—	0	—	2	—	0	—
12	4	2	12	3	2	0	8	8	4	2
10	8	4	21	12	7	0	13	9	7	4
8	16	8	47	25	10	3	18	16	9	5
Totals	352	192	92	42	22	3	49	35	23	12

Table II lists six social situations by which the development of coronary arterial stenosis in separated and paired males and females was compared to grouped males and to males and females in groups of 6, 12 and 24 with two males/female in each group. All birds that died during the course of this experiment were examined to

determine causes of death, and tissues were preserved for study. Survivors were killed for study at age 45 weeks.

Birds of flock I became increasingly excitable with sexual maturity and as adults responded to novel auditory and visual stimuli by outbursts of frantic activity and vocalization that often continued for several minutes. Hence 0.04 per cent diazepam was added to the food for flock II. This psychotropic agent reduced excitability without affecting rates of maturation. Its use also was accompanied by fewer deaths from all causes, 84 vs. 134, and deaths from leukosis, 40 vs. 72 ($p < 0.05$), and a change in the pattern of spontaneous deaths, which increased with group size in flock I but not in flock II.

Essentially equal numbers of males (22 vs. 23) of each flock died with myocardial necrosis. All were from heterosexual situations and in numbers proportional to "numbers at risk" in each situation. Females of flock II followed this pattern closely in numbers and situations, whereas only three females, all from the largest groups of flock I, developed myocardial necrosis. That is, oral diazepam was associated with an increase in ischemic necrosis of the myocardium in females caged with males, but not in males. However, oral diazepam also was associated with an increased developmental rate for arteriosclerotic stenosis of the intramural coronary arteries. Ischemic necrosis of the myocardium was found in five males and one female of flock II that died before age 20 weeks. All examples of this lesion in flock I were found in deaths after age 20 weeks (31).

Diazepam at the level used in this experiment has interfered more or less completely with the development of social hierarchies among grouped house mice (32). Social hierarchies were, however, established in the 4-2 and 8-4 groups of flock II, as determined by "pecking-order" criteria, and each bird ranked according to status after age 40 weeks (33). (Ranking could not be managed for the 16-8 groups). That is, because of limited resources, observations on behavior of these birds could not be started until the greater number of deaths from all causes (79 of 84) and with ischemic necrosis of the myocardium (33 of 35) had occurred. Deaths of grouped birds would be expected to have changed group behavior, but to what extent is of course unknown.

The values shown in Figure 4 have demonstrated that separated male chickens developed coronary stenosis at a more rapid rate than males in other situations. Separated males of flock I killed for study at age 45 weeks also had developed more advanced grades of coronary stenosis than males in other situations. However, a comparison of heart-scores for males and females that had died with myocardial necrosis with heart-scores for birds that died without this lesion, or that were killed, demonstrated that myocardial necrosis was associated with significantly greater values ($p < 0.001$). This relationship suggests that records of behavior should have been started shortly after the birds had been grouped. This relationship also indicates that myocardial necrosis in these birds was associated primarily with stenosis of the intramural coronary arteries.

The association between coronary stenosis and myocardial necrosis in birds of flocks I and II is reinforced by Figure 5. This chart is a summary of the record for 911 birds of both sexes and shows that for heart-score values below 2.50, less than 2 per cent (7 in 586) were found to have ischemic necrosis of the myocardium. However, the percentage with myocardial necrosis increased rapidly for heart-score values of 2.50 and greater, with 53 examples among 325 birds.

It will be recognized, of course, that "heart-scores" are derived from a method of sampling. These values represent estimates of the extent and severity of coro-

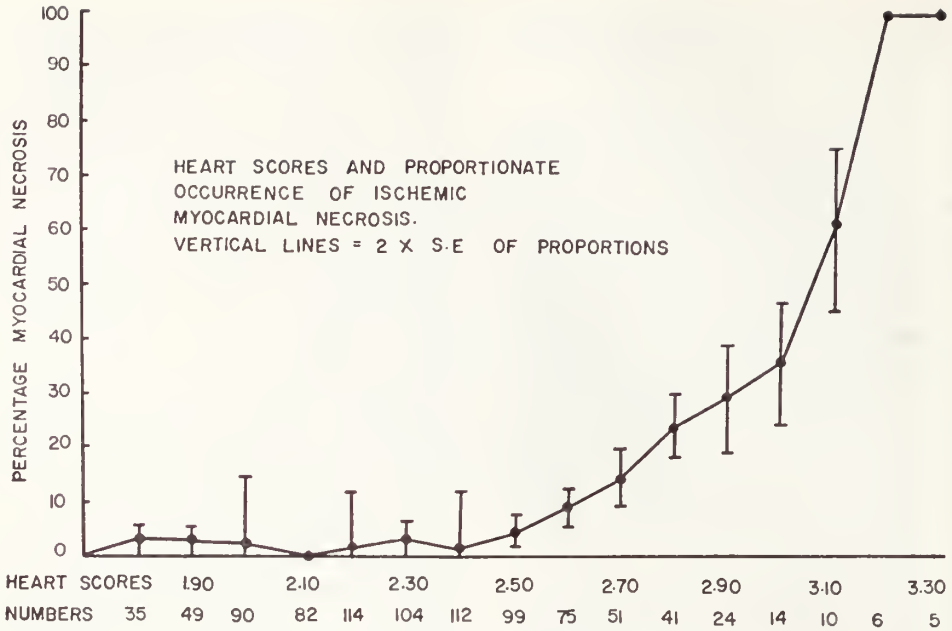

FIG. 5. Proportionate occurrence of ischemic necrosis of myocardium related to "heart-scores" (Ratcliffe, H. L. and Snyder, R. L.: Brit. J. Exptl. Path. 48: 357, 1967).

nary stenosis. The association between them and frequencies of myocardial necrosis (Figure 5) is within the range of accuracy expected of the method.

My associates and I have demonstrated that the heart-score method may also be used for estimates of the extent and severity of arteriosclerotic stenosis of the coronary arteries of swine (34). This study provides further evidence for an association between the more advanced grades of stenosis of the intramural coronary arteries and myocardial necrosis and fibrosis. At the same time, the study illustrates that behavioral responses to social situations may be species-specific and extrapolation from one to another species unwarranted. For example, female swine penned separately have developed coronary stenosis more rapidly ($p < 0.01$) than separated males, or females and males of pairs and groups.

Thus, two widely dissimiliar species, chickens and swine, have been used with equal success in tests of the following hypotheses. First, arteriosclerotic stenosis of intramural coronary arteries is induced by behavioral responses to social situations. And, second, arteriosclerotic stenosis of intramural coronary arteries so induced causes ischemic necrosis of the myocardium, with or without myocardial fibrosis.

The situations that have induced the development of coronary stenosis most effectively (associated with its most rapid development) have the common feature of preventing or frustrating intraspecific responses. A basic consideration in experiments designed for studies of coronary disease, therefore, is the behavior pattern of the species to be studied. The effects of separation, pairing or grouping depend upon this factor, rather than the social situation *per se*. Presumably, too, the responses of chickens, swine and many species of zoo animals may be influenced by the numbers and sex of co-species from which they receive auditory, olfactory and visual stimuli.

These experiments with chickens and swine also support the hypothesis that the

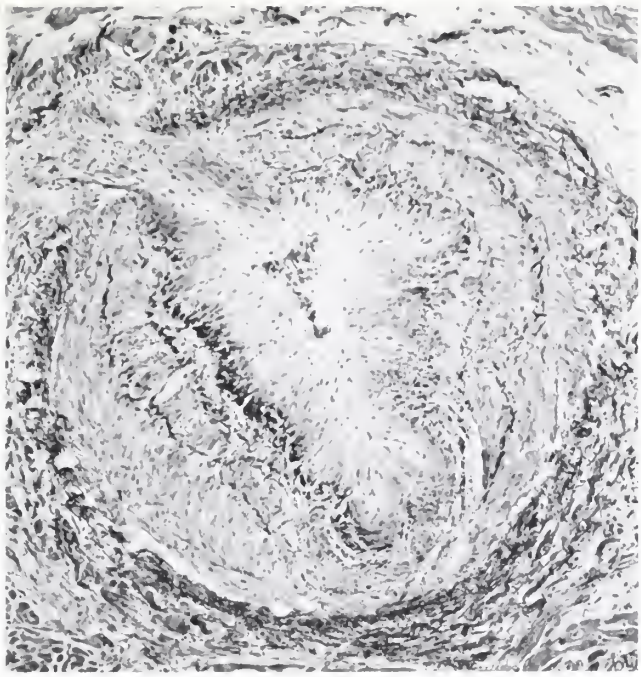

FIG. 6. Stenosis of an interventricular septal artery in a male gorilla aged 8–10 years (juvenile) associated with myocardial fibrosis. The medial coat of the artery is irregularly narrowed, internal elastic membrane replicated and lumen reduced by proliferation of smooth muscle cells which form elastic fibers and collagen (×80).

intensity of stimuli generated by disturbed behavior determine the rates of progress of arteriosclerotic stenosis of the intramural coronary arteries. Deaths of younger zoo animals (quarter I, Figure 3) with advanced intramural coronary stenosis and myocardial necrosis, therefore, are not surprising. A striking illustration of this phenomenon was seen in the recent death (1967) of a juvenile male gorilla (*Gorilla gorilla*) less than ten years of age after about two years in a situation to which he seemed unable to adapt. Major signs of his adaptive failure were an erratic appetite and recurrent attacks of ulcerative colitis. The severity of intramural coronary stenosis and the extent of myocardial fibrosis in this animal (Figures 6 and 7) suggest that his death may be attributed to myocardial ischemia.

The intramural coronary lesions in this series of zoo animals, as well as in the experimental chickens and swine, correspond closely to coronary lesions of animals of other zoos and of dogs and older swine. Stenosis or occlusion of the extramural coronary segments has been rare (26–28, 35–37).

Nevertheless, myocardial fibrosis in this zoo series and the experimental swine usually has been limited to the inner third of the left ventricular myocardium (Figures 8 and 9). Thus myocardial fibrosis in these animals corresponds in location at least, to myocardial fibrosis in man (38, 39). In man however, this lesion is most often attributed to stenosis or occlusion of the extramural coronary segments (10). This relationship is difficult to explain. A more reasonable explanation might be had, perhaps, by microscopic study of the more distal segments of the coronary branches adjacent to fibrotic foci.

In fact, a significant relationship between stenosis of the intramural coronary arteries and evidence of myocardial ische-

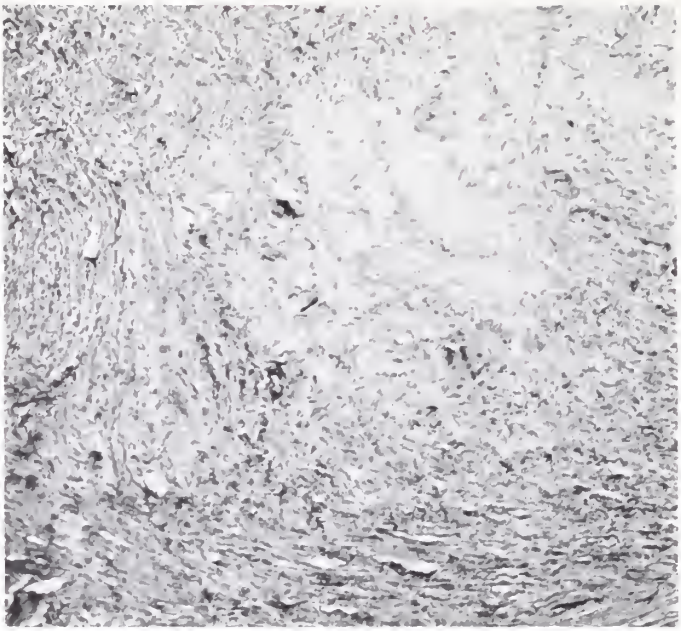

FIG. 7. Myocardial fibrosis in interventricular septum associated with lesion shown in Figure 6. Differential stains indicate that this scar is composed of immature collagen which extended irregularly into the surrounding myocardium to separate the relatively atrophic fibers (Movat ×20).

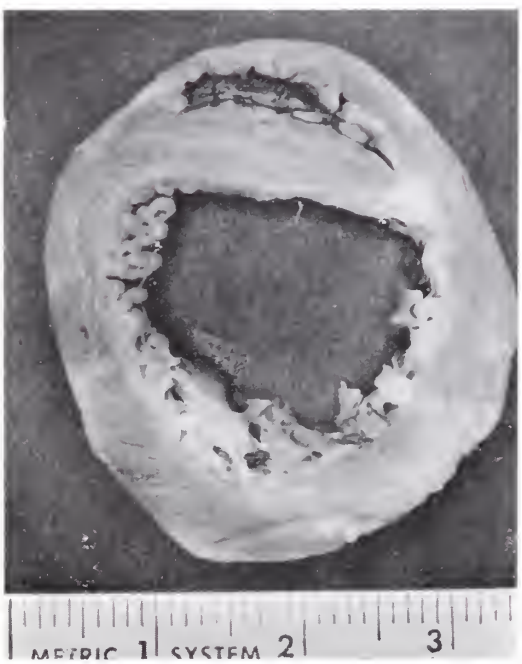

FIG. 8. Focal myocardial fibrosis in the left ventricular wall of an African monkey (*Cercopithecus talapoin* ♂) (original ×2).

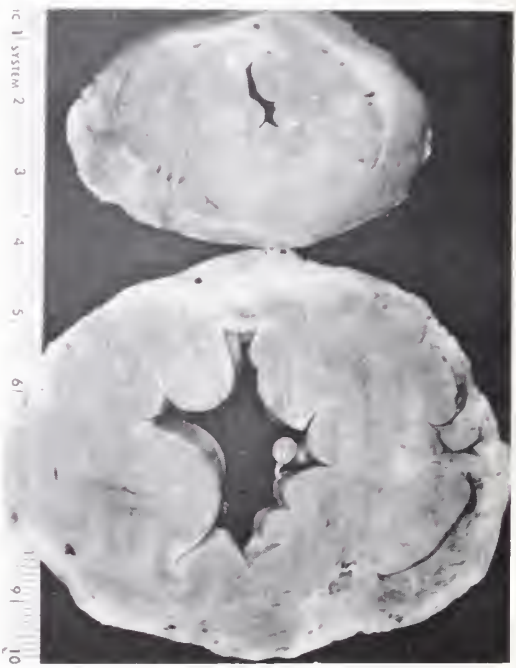

FIG. 9. Focal myocardial fibrosis with irregular transmural scar formation in an African lion (*Panthera leo* ♂) (original, slightly enlarged).

mia has been recognized since 1931 (41). This relationship also has been implied in reports of myocardial infarction without occlusion of extramural coronaries, and occlusion of extramural coronaries without infarction (42, 43). And several recent studies of material from man strongly support this relationship (44–47). It seems reasonable to suggest, therefore, that intramural coronary lesions of this zoo series and of the experimental animals may be related to coronary disease in man. Morphological differences may be understood to reflect differences in the intensity and duration of the causative stimuli.

Thus, zoo populations, which share the environmental defects to which mankind subjects itself, may become effective guides to an understanding of the interrelation of behavior and disease in man. Current studies that would explain urban death rates from heart disease, diabetes, cancer and tuberculosis in terms of income and patient care might consider, too, another penalty of poverty (48). Income also must determine to a large degree population density, as well as the social components of environment that depend on income and density. There is at present considerable evidence that relates coronary disease in man to behavior patterns either of the individual or the group (49–51). Evidence of this nature might be expanded far more rapidly through judicious use of zoo animals on controlled diets of high quality where physiological responses to social situation could be followed to death as the endpoint. This role for zoological gardens would simply represent expansion of their current use, i.e., education. The evidence reviewed here indicates a high probability of its success.

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Some Early American Pathologists[1]

By ESMOND R. LONG, M.D.[2]

PATHOLOGY was taught sporadically in early American medical schools, for the most part by professors in chairs that included a variety of medical disciplines. Surprisingly, in the light of later history, a significant part of the best instruction was by peripatetic teachers in the now-disparaged proprietary medical colleges.

Academic titles in pathology go back as far as the time of Peter Middleton, one of the founders of the medical school of King's College, forerunner of the present College of Physicians and Surgeons of Columbia University, who was named Professor of Physiology and Pathology[3] in 1767 when the College was organized. In the other American medical schools and hospitals of the eighteenth century, pathology was commonly taught within the framework of departments of anatomy or surgery, or the so-called Institutes of Medicine, sometimes as a system of medical theory, as by Benjamin Rush at the University of Pennsylvania, and at other times as pathological anatomy, as by Middleton at King's College.

As late as 1832, however, the eminent Philadelphia medical teacher Samuel Jackson (1) deplored the low state of pathology in America, calling attention, however, to the work of William Edmonds Horner, who "could alone be cited as having in a methodical publication directed attention to this subject," and that of John Godman. "Had the gifted and indefatigable Godman," he wrote, "been permitted to continue on his course there would have been less cause to reproach . . . the lagging science of our country."

John D. Godman

John D. Godman (1794–1830), a young and ambitious anatomist, was induced by the celebrated Daniel Drake to leave Philadelphia in 1821 for the professorship of surgery in the Medical College of Ohio, organized in Cincinnati two years before by Drake and his associates. This school went on to the stormiest history among the numerous contentious Ohio medical colleges. The dissensions proved too great a strain for the frail, comsumptive Godman, who soon resigned from its faculty, but remained in Cincinnati to serve as editor of a pioneer medical journal projected by Drake, The Western Quarterly Reporter of Medical, Surgical and Natural Science. This journal continued for only six issues, running to some 600 pages devoted to original articles, reviews, and translations of articles published abroad, which appear to have reached Cincinnati with some regularity in spite of the difficulties of transport. Within the pages of this journal, much attention was devoted to pathological anatomy, in part because of the influ-

[1] Victor Robinson Lecture IX (condensed), Temple University School of Medicine, Philadelphia, Pennsylvania, 25 October 1967.

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[3] The only written records that exist for this kind of information for the early days of King's College are the Governors' Minutes. In the Minutes of August 14, 1767, it is stated that Peter Middleton was appointed "Professor of Physiology and Pathology." No other or more complicated title was used at that time. (Communication from The Head, Medical Reference Section, The Medical Library, College of Physicians and Surgeons, Columbia University, New York.)

ence of Drake, who was always deeply interested in the subject and himself a teacher of its elements in the Kentucky and Ohio medical schools. In this journal, in Godman's time, Drake brought notice to its readers of the preparation of his later well-known book, not published until 1850, *The Diseases of the Interior Valley of North America* (2).

Godman returned to the East in 1822 and soon was teaching anatomy in the Philadelphia Anatomical Rooms, which had been opened by the anatomist and surgeon J. V. O'B. Lawrence. He took advantage of every opportunity to observe morbid anatomy. His experience, which was marked by three grave septic dissection wounds in his own person, was presented to the public in 1825 in an 86-page brochure entitled, *Contributions to Physiological and Pathological Anatomy* (3). It was a compilation of his observations of a wide variety of diseased organs. These were set forth, however, in a haphazard manner, without much detail, and the work is immature in comparison with the great European compendia of the period. Yet it stands forth, modestly to be sure, as America's first monographic treatment of the science of pathological anatomy.

FIG. 1. John D. Godman

Godman was a talented writer and editor. For a time he was one of the editors of the Philadelphia Journal of the Medical Sciences, precursor of the American Journal of the Medical Sciences. He wrote in scholarly style on natural history and travel as well as on medicine. But his life was short. He was the victim of progressive pulmonary tuberculosis and died at the age of 36. Francis Packard (4), author of *History of Medicine in the United States*, described him as "one of the most pathetic figures in American medical history."

William Edmonds Horner

The other student of pathology to whom Samuel Jackson referred, William Edmonds Horner (1793–1853), was, in contrast to Godman, in a secure and entrenched place in the University of Pennsylvania. Caspar Wistar had brought him into the Department of Anatomy as dissector in 1816. He rose steadily in rank, and in 1831 succeeded Philip Syng Physick as head of the department. He wrote voluminously on anatomy. His *Treatise on the Special Anatomy of the Human Body*, first published in 1826, went through eight editions. He was active in all university affairs and for thirty years was Dean of the School of Medicine of the University of Pennsylvania.

Horner's interest in pathological anatomy, like Godman's, stemmed in part from his studies of dissection room material. But it went much beyond that. He made post-mortem examinations at the old Philadelphia Almshouse (later the Philadelphia General Hospital) and made them for Philadelphia physicians in cases in their private practice. In 1826, partly for the benefit of the latter, but more largely in

the interest of improved medical science, he brought out his *Treatise on Pathological Anatomy* (5), a volume of some 150 pages, which may truly be called the first American text in the field, although it was far inferior in content to the comprehensive two-volume treatise published by Samuel D. Gross under the title, *Elements of Pathological Anatomy*, ten years later.

Horner was well versed in the writings of the contemporary French pathologists and adopted the views of Broussais on "irritation" and dominance of the gastrointestinal tract. His interest in the latter led him later into closer studies than had heretofore been made of the tract in Asiatic cholera and to his recognition of characteristic pathological changes in the intestinal mucosa and of the pathognomonic "rice-water stools" in that disease (6). Horner's book illustrated both the current advances and the shortcomings of pathological anatomy in 1829. It included a series of chapters on degenerative changes and specific descriptions of disease processes in individual organs. It was reviewed with praise by Godman in the American Journal of the Medical Sciences.

FIG. 2. William Edmonds Horner

The book was published by the press that printed the latter, and, in passing, it may be noted that both Godman and Horner were frequent contributors to that journal and indeed appeared as authors in its initial issue.

Horner acquired fame in the United States and abroad in his special field of anatomy and was noted for his devotion to medical education. In the *Treatise on Pathological Anatomy*, he referred to the subject as a science that had taken "a high and commanding attitude in Europe" and, indeed, as "the light and test of every opinion in medicine." But he lamented its undeveloped state in America. In genuine humility, he tried to remedy the defect as well as he could by writing a text himself.

In 1818, he traveled in Europe and was cordially received by eminent medical leaders, including the pathologist Carl Rokitansky in Vienna and the physiologist Johannes Mueller in Berlin. But it was near the end of his life. Never robust, he deteriorated rapidly in his later years, suffering from failing heart, dyspnea and edema, carrying on with his work, however, until his death in 1853.

The 1830's, we may note here, were productive years in the development of pathology in Philadelphia. The American Journal of the Medical Sciences played a great part. In its pages appeared the studies of Godman and Horner, as noted in preceding paragraphs, and also the classic paper of William Wood Gerhard and Casper W. Pennock on the distinction between typhus and typhoid fevers (1837), an outgrowth of their studies under P. C. A. Louis in Paris. Gerhard was an influential force in the development of pathology in Philadelphia and a founder of Philadelphia's first, but short-lived, pathological society (1839). Horner, too, was active in its affairs.

SAMUEL D. GROSS

The 1830's were still more significant for the development of pathology as a general

medical discipline. In 1833 another native Pennsylvanian, a graduate of Jefferson Medical College, Samuel D. Gross (1805–1884), moved to Cincinnati to become demonstrator of anatomy in the Medical College of Ohio. Gross was well acquainted with Godman, who had recently returned from Cincinnati to Philadelphia, and knew others in the shifting faculties of the midwestern medical schools. Of them all, Daniel Drake was the most persuasive in directing his pioneering spirit into the field of pathological anatomy. Gross, like Drake, found the quarrelsome atmosphere of the Medical College of Ohio uncongenial and in 1835 accepted a chair in the fields of anatomy, pathology, physiology and medical jurisprudence[4] in the Medical Department of the Cincinnati College of which Drake was a founder and continuing leader.

The next four years of Gross's professorship were heavily occupied with his own general practice, as well as teaching, but his major interest was the preparation of his *Elements of Pathological Anatomy*, published in 1839, which was not only the first exhaustive and accurate text of general and special pathological anatomy published in America, but the first of comparable scope in the English language (7). It was extolled for its excellence by the distinguished and highly critical pathologist Rudolf Virchow.

[4] Gross's official professional titles illustrate the academic combinations of the times. The catalog of the Medical Department of the Cincinnati College for 1835 lists him as Professor of General and Pathological Anatomy, Physiology, and Medical Jurisprudence. That for 1838–39 records his position as Professor of General Pathological Anatomy and Physiology. On the title page of his *Elements of Pathological Anatomy* of 1839, Gross identified himself as Late Professor of General Anatomy, Physiology and Pathological Anatomy. In his autobiography (posthumous, 1887), however, he cut through these complexities with the simple statement that in 1835 he was appointed by the trustees to a chair in Pathological Anatomy. That, we may be sure, was the chair as he saw it in retrospect, and there can be no quarrel at this late date with his identification of the chair as essentially in that subject.

With Gross, the study of pathological anatomy fulfilled an inner urge. Years later, when he was the outstanding surgeon in America, he referred back to this early experience in pathology as basic for his later profession. He read foreign literature intensively while preparing the book and stressed the great need for an adequate American text. He was familiar with what Godman, Horner and others had done, but considered their compendia inadequate. He deplored the general lack of recognition, in America, of the pathologic-anatomical basis of disease. His own comprehension of pathological anatomy was acquired from study of the works of others, from autopsies he made for medical colleagues in Cincinnati, and in no small measure from his observations in the course of frequent trips to the Cincinnati slaughter houses. He was completely self-taught, deeply regretting that there was no one to guide him. His interest, to be sure, was greatly stimulated by Daniel Drake. Gross referred to Drake as a "friend of pathology" and dedicated his *Elements of Pathological Anatomy* to him.

FIG. 3. Samuel D. Gross

The book went through two more editions, in 1845 and 1857. The latter came out when Gross was in his final post as Professor of Surgery in the Jefferson Medical College of Philadelphia. He was assisted in its preparation by a distinguished colleague, the internist Jacob Da Costa. The book had improved with advances of the time; pathological histology was well represented in the third and final edition.

Gross had moved to Louisville in 1840 as Professor of Surgery in the Louisville Medical Institute. There he was again associated with Daniel Drake and there began his rise as a surgeon to his ultimate commanding position in that field. His course was marked by a stream of influential scientific contributions in a career of phenomenal industry. His autobiography (8), which records many notes on his friends and associates, is an American medical classic.

FIG. 4 John Barnard Swett Jackson

John Barnard Swett Jackson

The first chair of pathological anatomy devoted exclusively to that subject was set up at the Harvard Medical School in 1847. The chair represented a belated recognition of the need for specific instruction in that medical discipline. In that year, the President and Fellows of Harvard University voted that a physician be appointed as Professor of Pathological Anatomy, with the assigned duty of lecturing to students in the medical school and acting as Curator of the Anatomical Museum. John Barnard Swett Jackson (1806–1879), a nephew of James Jackson, Professor of the Theory and Practice of Physic at Harvard, was elected to the position. J. B. S. Jackson was well trained in medicine at Harvard and later in Paris, Edinburgh and London. In the latter city an interest in pathology was excited by Bright, Addison and Hodgkin, and in 1831 Jackson returned to Boston to devote his life to the subject.

In 1853, funds for a professorship were supplied by George Cheyne Shattuck, one of Harvard's many benefactors, and Jackson became Shattuck Professor of Morbid Anatomy. In a sense, the professorship foreshadowed the development of the full-time chairs of pathology of later years.

Jackson's colleagues included Oliver Wendell Holmes, who, like Gerhard, had been a student of P. C. A. Louis in Paris. Holmes' famous paper on the "Contagiousness of Puerperal Fever," epoch-making in the history of American pathology, had appeared in 1843. Holmes was Professor of Anatomy at Harvard from 1847 to 1882 and Dean of the Medical School from 1847 to 1853. Jackson succeeded him as Dean in the latter year.

One of the best pictures of J. B. S. Jackson as Professor of Pathological Anatomy was given by Samuel D. Gross, whose productive career in pathology has been noted in the preceding section. The two were warm friends. They first met in 1839, when Gross was in Boston seeking a publisher for his *Elements of Pathological*

Anatomy. Gross described them as "young men full of ambition and enthusiasm." They corresponded frequently for the rest of Jackson's life. Gross's note of Jackson's last days, in his autobiography (8), is a finely written, touching tribute.

Gross left a multitude of scientific contributions, and Jackson very few. Jackson's talent was of an entirely different kind. He was recognized as the most competent pathological anatomist in New England and accumulated a huge amount of pathologic-anatomical material, which he cataloged and displayed in a masterly way. As Gross said, for many years hardly any specimens of importance from the region failed to reach his hands for examination. His accumulated specimens enriched the Warren Museum of Harvard University and the cabinet of the Boston Society for Medical Improvement, a cabinet of which Jackson was a founder, and, in the words of Oliver Wendell Holmes, "its life and soul."

Gross urged Jackson to embody the results of his observations in a major work on pathological anatomy. Gross felt that Jackson, with his immense collections, should have been "the Rokitansky of America." Jackson, however, was essentially a collector and cataloger. His notebooks are treasured items in the Francis A. Countway Library at Harvard today. But—to quote Gross again—"he died without having produced any worthy literary or scientific work, having contented himself with furnishing a catalog of each of the museums of which he was the presiding genius."

To his lasting credit, however, was his firm establishment of the first department of pathology, in a modern sense, in the United States, and a chair that has been occupied by only five men, except for one brief formative rearrangement, in a hundred twenty years. The first of his successors was Reginald H. Fitz, of appendicitis fame, who was trained by Jackson and succeeded him in 1879 as head of the department.

Transition to Modern Departments of Pathology

During the years between Gross's *Elements of Pathological Anatomy* and the time of Jackson, pathology was taught in many places without the dignity of an established department and largely by fast-moving, peripatetic professors in the proprietary schools. Among them was Elisha Bartlett, notable in medical history for his studies of typhoid and typhus fevers, who taught various subjects, including pathological anatomy, in at least eight medical colleges.

To be noted, too, in closing, because in a way he marked the transition between the peripatetic proprietary school faculties and the later more nearly full-time departments, was Alonzo Clark. Clark, Bellevue Hospital-trained, occupied chairs in a number of New England proprietary schools before coming to the College of Physicians and Surgeons of New York as Lecturer on Physiology and Pathology in 1847, the year that J. B. S. Jackson was appointed Professor of Pathological Anatomy at Harvard. He was made professor of the two subjects in 1848. Jackson's department was continued as that of Pathological Anatomy or Morbid Anatomy from the time of his first incumbency. Clark's position remained one of multiple academic responsibilities, which came to include "Practical Medicine," but under his successor, Francis Delafield, a break-up occurred, out of which emerged two departments, one of them a department of pathology under Delafield's younger associate T. Mitchell Prudden. The two collaborated in the famous Delafield and Prudden *Textbook of Pathology*, long the principal American text on the subject.

This is an appropriate place to leave the subject of "early American pathologists." Delafield was a teacher of Welch, and notable "schools" of pathology were

in prospect under such men as William Pepper in Philadelphia and Christian Fenger in Chicago. The proprietary schools had had their day, but their place in early American education in pathology is not to be forgotten.

Summary

The teaching of pathological anatomy in the United States was sporadic in the first half of the nineteenth century but attained a respectable state by 1850. Some of the best of it was in the proprietary medical schools of the Middle West.

Significant contributions were made by John D. Godman of Philadelphia, William Edmonds Horner of the University of Pennsylvania, Samuel D. Gross of the Medical Department of the Cincinnati College, and John Barnard Swett Jackson of the Harvard Medical School. Gross was the author of the first comprehensive text of pathological anatomy written in America or elsewhere in the English language (1839). He is to be considered in actual practice as the first professor of pathological anatomy in the United States.

The first chair of pathological anatomy in the United States devoted exclusively to that subject by academic appointment was established under Jackson in 1847. It foreshadowed modern full-time appointments. After 1850 there were pathologists of distinction in several schools, who taught the men considered today as the founders of modern American pathology.

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Secession from Northern Medical Schools

By HAROLD J. ABRAHAMS, PH.D.*

EVEN before the Civil War, Philadelphia was famous for the excellence of its medical practitioners and its medical schools, and many young men from the South travelled to Philadelphia to study at two famous schools, Jefferson Medical College and the University of Pennsylvania. Lured by the fame of the two great medical schools, the excellent educational opportunities afforded by the hospitals and clinics, and the general social and intellectual atmosphere of the city, the young men of Dixie considered Philadelphia a favorite place to study medicine. A reciprocal affection existed between the medical students from the South and the city to which they had come for the purpose of learning the art and science of medicine. The city was proud that the gentle Quaker element in its history had contributed so richly to the development of the humane spirit of medicine, and the courtly bearing of the boys from the South, engrafted upon this spirit, made the terms "doctor" and "gentleman" almost synonymous. This was so, despite the fact that many of the students affected a rough, frontiersman facade, their long hair reaching to their shoulders and crowned with enormous black sombrero hats, some of the boys going to class with Bowie knives dangling from their belts (1). That the treatment accorded the Southern students in Philadelphia was friendly is attested by a letter from one of their number to the *National Intelligencer,* which reads, in part, as follows:

> ... many Southern students ... will also unite with me in saying that in our intercourse with the citizens of the city we have been treated with marked kindness and attention. We have been hospitably received in their family circles, invited to their entertainments, associated with them in public, and many of us nursed in sickness with all the care and kind attention which we could possibly have received in our own homes. Our Professors have been to us all which their position and their relation possibly called for—kind and polite to all, affording assistance if needed, and most fully have fulfilled their engagements in the lecture room to the satisfaction and admiration of the students. So agreeable has been our sojourn here that when we leave, as most of us will do at the expiration of the present course of lectures, it will be with feelings of regret that relations affording so much pleasure should be broken up, and with the hope that our friends of Philadelphia will soon give us an opportunity, in our Southern homes, of returning as best we may their kind hospitality and attention. ...

Suddenly, in 1859, a dark cloud appeared. "The very devil seems to have got into the students," Dr. Gibson, one of their professors at Jefferson, remarked (1). The clarion cry of "Secession!" was heard. Secession—not only of Southern states from the United States of America, but also of students from their schools—struck at the medical schools as students began a patriotic retreat to positions below the Mason-Dixon Line to continue their medical studies at Southern schools of medicine, in pursuit of those ideals of loyalty which the political situation demanded.

The stampede had its beginnings in a meeting attended by the Southern students on the morning of December 20, 1859, in the south room on the second floor of the Assembly Building, which had only one week earlier been the meeting place of the Anti-Slavery Convention. The leadership was provided by T. F. Lee and T. C. Hill from Alabama and Emmett A. Drury and J. W. McIlhany from Virginia. The meeting unanimously resolved to request Drs. F. E. Luckett and Hunter H. McGuire, both

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thought to be men of unselfish devotion to high ideals, "to bring about a proper state of feeling among Southern students" and "to announce publicly their position and accompany us to our Southern institution." Luckett then read a telegram from Governor Wise of Virginia, offering a cordial welcome to his State and all expenses paid for the trip. Letters from other schools in Virginia, South Carolina and Georgia, likewise offering welcome and certain inducements, were read. Dr. McGuire suggested that the seceders leave in a body the next evening. A set of resolutions was read and passed. The preamble stated that the students had come to the city in good faith but were finally convinced that it had been a mistake to do so and to spend their means and devote their energies toward the maintenance and advancement of medical schools other than those of their native states. The first three resolutions read as follows:

1st. Resolved, That we in a body, or as many as approved of the act, secede from the institutions in which we have severally matriculated, return to the South, and herein pledge ourselves to devote our future lives and best efforts to the protection of our common rights and the promotion of our common interests.

2nd. Resolved, That in taking this step, we disclaim any personal animosities and deprecate any political agitation.

3rd. Resolved, That we tender our grateful acknowledgements and heartfelt thanks to the Hon. Henry A. Wise, Governor of Virginia, and Dr. S. L. Joynes, Dean of the Virginia Medical College at Richmond; Henry R. Frost, Dean of the South Carolina Medical College; to Edwin Robinson, Esq. President of the Richmond, Fredericksburg and Potomac Railroad Company, and all others who have extended to us the substantial encouragement and aid so essential to the furtherance and successful accomplishment of our enterprise.

(The fourth resolution invited and welcomed Northern Medical students to follow the seceders South, the fifth resolution invited all Southern medical students to do the same, and the sixth resolution asked the Southern newspapers "to publish the proceedings of this Convention.")

The meeting at which the students made the decision to secede in a body and carry out a mass migration to Southern medical schools was attended only by boys from below the Mason-Dixon Line, Northerners being emphatically excluded. It lasted less than an hour, and there were several speeches but little display of enthusiasm. Richmond, Charleston, New Orleans and other Southern cities were mentioned as destinations for the departing students.

It is true that the hanging of John Brown and the parading of his mortal remains through city streets by his partisans had been followed by frequent rioting by the students. [In a total enrollment of 660 at Jefferson, 274 were Southerners, according to one author (2); 419 of the same enrollment were Southerners, according to another writer (3).] Claims went forth that "twenty-five were put in prison, in a calaboose, and otherwise insulted." A counterclaim stated, "It is not true that twenty-five medical students were arrested here. There were not twenty arrests altogether in National Hall, and of these the majority were Philadelphians." Certain it is that emotions ran high among the men of the South in Philadelphia. But would this fact have been adequate to explain the exodus? An interesting statement appears in a Philadelphia newspaper two days after the leave taking:

THE ESCULAPIAN STAMPEDE

If all the flags in Philadelphia are not at half-mast—if her half a million of men and women are not "mourners going about the streets"—if the joys and festivities of this Christmas season are not "shaded o'er" with grief and woe, it is because we phlegmatic, broad-brimmed, and stolid Pennsylvanians are insensible of the awful calamity which has befallen us. Our once fair city has been covered with disgrace and shame. It is no longer a fit place for self-respecting men to dwell in. Gentlemen will snub it. High-toned and chivalrous personages will be ashamed to confess that they were born here, or that they ever pressed its pavements with the soles of their feet. It is destined to share the fate of Baalbec or Nineveh. The shipping (?) will rot along its wharves. The sails of commerce will flap idly by falling masts. The cheerful noises of trade and manufactures will cease to resound in its streets.

Market street will be deserted by buyers. Its goods will decay unsold upon their dusty shelves. Chestnut street will become the habitation of owls and bats. The granite structures that adorn its now thronged vertu, and rear their spendid fronts along Third, Walnut and Broad streets, will crumble to pieces. This vast mart of industry, traffic and business, will sink into an inland village. The peaceful kine will ere long begin to browse upon the grass that will grow along Front and Second streets. Shepherds will feed their quiet flocks in Independence Square. The days of Philadelphia are numbered. The sun of her prosperity has set forever. Desolation is written upon her walls, and ruin sits frowning upon every spire and house top. Howl ye Philadelphia merchants! Wring your hands in hopeless despair ye Presburys, Campbells and Wards at the sorrowful spectacle of your deserted Girards, St. Lawrences, and La Pierres! Ye Edwardses, Norrises, Jaynes, Barings, and Gratzes that were once considered rich because ye owned so many acres in this ruined city, know ye not that ye are now paupers! Oh! Philadelphia, Philadelphia, city of our love and pride, have we lived to see all this!

"All what?" perhaps some stupid reader may inquire—"What means this booboo?" may be the unfeeling question of some sordid wretch. Has pestilence swept the City with its miasma breath—has the Delaware river dried up—is there a secret and subterranean lake beneath the City, into which it is submerging, taking the Schuylkill along with it—has a Popocatapel volcano burst forth from Jersey or Chester county, which threatens us with the fate of Pompeii? Ah! irreverent reader, you may sneer; but let your sneer be turned into grief and fear; but be it known to you, that, on last Wednesday night, not less than One Hundred and Fifty (more or less) medical students, "all in a row," like the king's blackbirds, actually left this City, because—because—because—we really are ashamed to say it—because this City is "tainted with Abolitionism!" Isn't that dreadful! There is the "nigger," Bob Purvis—the Mayor will not allow the students to break his head. There is Mr. Furners—the Mayor will not allow the students to tar and feather him. There is Lucretia Mott and Mary Grew—the Mayor will not allow the students to pelt them with eggs and oil of vitriol. Isn't this a land of liberty? Why, then shall not the students enjoy the pure privilege of lynching Abolitionists and burning down National Hall. These young gentlemen are the scions of "first families;" they come from a land of chivalry; they are models of peace, forbearance, and devotion to science; why does Philadelphia so outrage their youthful sensibilities as to allow vulgar ignoramous like Curtis to lecture here on any "peculiar" subjects? It is too bad! We think the seceding students did perfectly right. Is not this pestilent toleration of Abolition fanaticism a matter closely connected with medical science? How can any right-minded Southern student learn the science and art of cutting up legs and arms, when National and Concert Halls suffer old women and Howadji* literateurs to be a cutting up this blessed Union? No Virginian or Alabamian who has the slightest respect for himself or his noble State, can submit to hear the lectures of Dr. Dunglison, or Dr. Pancoast, or Mr. Gross; for don't they live in the same town with Miller McKim and Passmore Williamson? There is a connection between medicine and politics. Both are often hard to take. Both frequently nauseate the stomach. A man cannot be a good doctor unless he understands the Constitution. Therefore it is clear that Jefferson Medical College is not fit to teach the young gentlemen who are to cure the fever and diarrhoeas of the chivalry. It is all a mistake that Philadelphia has the best medical schools in America. Richmond, Charleston, and New Orleans have, as all the world knows, far better physicians, and are particularly full of science, learning, and great medical universities.

But these noble youths are gone, and we must all do the best we can. No longer will their cheerful tobacco smoke and genial whiskey drinkings enliven the upper rooms of the landladies where they did board! No longer will their heroic bowie knives and revolvers gleam in the gas light at street corners and in oyster cellars! No longer will their delicate attentions gladden the hearts and purses of the demoiselles who glitter along Chestnut, Duponceau, and Pine Alley!

But take comfort, ye landladies, and washerwomen! The patriotic seceders, may, of course they do, owe you some dollars, for meat and clean linen; but had they stayed till Spring they would have owed you "many more." Take heart of grace, oh ye "filles de joie;" for are there not railroads and gallant railroad conductors to escort you to Richmond and Charleston after your flying Lotharios? And if Philadelphia allowed them to depart, surely it will not insist on your staying here.

A word to the Mayor. Our departed friends occasionally required the assistance of the police during their pleasant and facetious escapades. Sometimes the City generously lodged them in her houses of public accommodation. No less than fifty of these young gentlemen have figured in the police register since their arrival here last fall. Now that they have gone ought not the police force to be reduced? What says the Mayor?

It seems that Dr. Luckett and Dr. MaGuire, two eminent masters of the healing art residing in this city, were chiefly instrumental in helping the young gents away. Are they going to follow! Especially

* A merchant or rich gentleman.

after they entitled themselves to so much practice here!

A final idea occurs to us. We take it for granted that as these Southern students left Philadelphia, they remembered with warm and grateful feelings that only a few years ago, Philadelphia sent thousands of her money, and many of her nurses and physicians to stay the pestilence that ravaged Norfolk in Virginia! And remembering this, we can readily suppose, they will never stain the soles of their boots with the contaminated soil of a region that tolerates the freedom of speech and the right of a few old women to assemble and lend their approving smiles to the treasonable doctrines of an "itinerant" lecturer.

Another voice, in the form of a letter to the editor, gives another picture:

The Medical Students

To the Editor of the Philada. Evening Journal.

In your editorial of yesterday on the subject of the students, who have just abandoned the duties for which they came to this city, you have inadvertently committed errors of fact as well as of inference, and you will permit me to say that Doctors Luckett and Maguire were not "connected with the Jefferson Medical College as examiners," nor, indeed, connected with it at all, and were equally unconnected, I believe, with any public Medical School in Philadelphia. In this very fact, and because they were not looked upon with favor or respect by the Medical School referred to, is to be found the secret cause of the dishonorable conduct recently pursued by Doctor Luckett.

These doctors have been the holders of what are termed "quiz classes" or "crammers" of medical second class students, aiding them in preparations for their final examinations before the Faculties of the various colleges, but without sanction, authority, or even sympathy from any of them. They cared but little from which of the schools these young men came to them, as what they wanted was only the payment for their private ticket, and the greater the numbers, the more money. Unfortunately for the Students, Doctor Luckett had acquired undue influence and popularity among them—unfortunately—because this power was chiefly obtained by "intemperate habits!" and low "familiarities that (eventually) breed contempt."

No doubt these "quizzers" were ambitious of rising to the dignity of Professors, and it is shrewdly intimated that the promise or hope of a Professorship in a Southern College, upon the condition of being able to detach from the North a few hundred students, has been the selfish and unworthy temptation under which Dr. Luckett misled and carried off the young gentlemen who have foolishly become the victims of this scheme, rendered the more easy of accomplishment at a moment when their better feelings, and the sympathies natural to young Southern men, have been unduly excited. But, sir, I lack language strong enough, without descending into calling hard names, fitly to express the scorn or indignation due to the course of the parties engaged in this small conspiracy. It is plain that it originated with Doctor Luckett, but he has not been without aiders and abettors. By telegraphic message the faculty of the Richmond Medical School offered Doctors Luckett & Co. the free use of their public lecture room for their private class—and the students accompanying their "quiz" teacher are to attend to lectures of the College without charge—a boon also obtained through message to Drs. Luckett and Maguire.

We can only hope that such unprofessional and dishonorable conduct, whoever may be concerned in it, will meet the just penalties that belong to deception and selfish imposition practised upon the young, who have, in this instance, been made the "cats-paw" of the designing, at the severe expense of their medical education and future usefulness.

W.T.

Yet another spoke as follows:

The Seceding Students.—Since our last issue a number of Southern medical students have left their colleges "in disgust." Sounds of lamentation and woe have since been resonant all through Locust and Duponceau streets. The students left because they didn't like the idea of spending money in a city that harbored abolitionists. The students in question have bitten off their noses to spite their faces. Nobody loses anything but themselves. The number who left was two hundred and sixty. They were offered a free education for this winter in a one-horse college at Richmond, Virginia, and took the bait. The scene at the Baltimore depot when they left was spicy, and was rendered tragic by the groans of the unrequited cordwainers, unpaid bootmakers, and unappreciated tailors who mourned their own credulity and the departure of their debtors. The University loses but eighteen pupils. The bulk of the seceders were pupils at the Jefferson. They left because Professor Pancoast was a Republican and voted for Fremont, and because he said at a dinner party that he pitied "Old Brown."

By next winter, we take it, the students will prove repentant and return. In this city they are among friends, as they will yet find out. That they have mistaken the ravings of a handful of fanatics for the sentiment of the public is a matter which tells with little credit for their good judgment. The absence of hospital and clinic instruction, as well

as of dissecting material, will soon send them back to their first love. Sack-cloth and ashes for 260!

Southern newspapers repeated the charge that the "principal cause was that they (the students) were inhospitably treated."

The great commotion caused by the students at both schools and in the city generally made one of the professors, Dr. Samuel D. Gross, request the Dean to address the boys, but the Dean's speech fell upon deaf ears. Dr. Gross later said that the Dean's appeal was too weak and too late. Dr. Gross himself made one more effort to dissuade the seceders, speaking to them for fifteen minutes on the subject on the day before the exodus took place. Although his speech, pointing out the importance of remaining in school until the end of the term, was listened to with politeness, it had little effect.

Under the caption, "Practical Secession —Stampede of Southern Students," one of the Philadelphia papers said:

...It appears that the officers of some of the Southern medical colleges have made overtures to the students attending the colleges here, for the purpose of inducing them to desert their schools and proceed to the institutions in the South. This report was put in an authentic shape by the *Richmond Enquirer*, of yesterday, which contained the following paragraph:

"Good News for Richmond and the South—On Saturday evening a dispatch was received by the Faculty here from Philadelphia, asking upon what terms the Richmond Medical College would receive one hundred and fifty Southern medical students for the present session. The faculty very promptly, and properly, replied that, as the said students had already paid their College fees in Philadelphia, they would be cordially received here and be instructed without cost, save only that those who should graduate would be expected to pay their graduation fees. We take it for granted that the proposition will be accepted and that thus a very important step will be taken for building up our Medical College, and aiding in the independence of the South..."

Another newspaper item said:

...That there has been gross wrong somewhere in the tampering with the inflammable passions of young men, who had been previously excited beyond the exercise of a sober judgment, is now certain, and it is to be hoped that means will be speedily taken to detect and expose those who have been guilty of it. If it should turn out to be true, as is more than suspected already, that Drs. Luckett and Maguire, to promote personal ends of their own, have instigated the seceding students to the course they have adopted, no terms of denunciation can be too strong for their conduct. As soon as we can get possession of reliable facts we shall have something to say in this connection.

The press reported that two hundred students would leave Jefferson Medical College and one hundred would forsake the University of Pennsylvania. Inquiries by telegraph began to reach the city from anxious parents and other relatives of the seceders, displaying their uneasiness over the misguided actions of the young men. On the other hand, Dean Robert E. Rogers, at the University, remained calm and tried to allay the fears of relatives by announcing in a "card" in the *Evening Journal* that only eighteen of a class of more than five hundred had left the city, and a prediction appeared in a newspaper that this rash and regrettably foolish act would culminate in the students' being very glad to return. Sober second thought, one newspaper predicted, would bring the students to a realization that they had acted without any "real reason of offense," and that, if the secession succeeded, the result would be a loss in training, skill and consequent professional standing of these rising physicians and surgeons. (Indeed, before the secession meeting had ended, a number of Southern Federal Senators telegraphed the students, asking them to reconsider their resolutions and thus avoid adding to "present political difficulties.")

Further newspaper comment ran as follows:

...We observe, however, that Governor Wise of Virginia, has invited the students to the College at Richmond, stating that they would there 'be received with open arms,' also, that they are invited by the Medical Colleges of North Carolina and Georgia, where they 'would be welcomed in a handsome manner'.... The Southern Colleges desire

to withdraw the students from the best Medical and Surgical Schools in America. But will they succeed? We think, and indeed hope not.... the rising Doctors and Surgeons would lose cast and professional information and skill by the change—and then, we should be sorry, we confess, that our native city should suffer in one of her most valuable and time-honored attractions. But there is, in the American mind, a very useful element, known as 'sober second thought!' We think that, on mature consideration, the students will arrive at the conclusion, that they have acted without sufficient cause—in fact, without any real reason of offence, and review their precipitate, immature decision....

In periods of political excitement manly forbearance and a prudent patience must be exercised by truly conservative and rational men, and those who represent the intellect of their sections should aim as far as possible to apply the tests of reason to all causes of inflammation.

Students on the Move and Their Arrival

Two days after the caucus, a despatch arrived from Washington (December 22, 1859) that about two hundred students from Philadelphia had passed through the capital on their way to Richmond and further south. It had been hoped that the train would pull in at ten in the morning so that the young men could be tendered a reception by Senators and Representatives, but the train arrived at the ridiculous hour of 5:30 A.M., so the passage of the students through Washington was uneventful. However much of a loss this may have been, it was more than compensated for by ceremonies along the way. The next part of the trip was 40 miles by boat, down the Potomac, to Aquia Creek. There a deputation of students from Richmond Medical College met the seceders.

When the steamer approached the dock, a "hurricane of voices"—cheers from her decks as well as the shore—reverberated across the Potomac for several minutes. Every head was bared and there was a wild waving of hats and handkerchiefs. As the students landed, their hands were shaken heartily, and they listened to an eloquent address of welcome, after which there were three hearty cheers and then a swift boarding of the train for Richmond. Both colored and white people cheered them enthusiastically as the train rolled along, and at Fredericksburg a great crowd loudly acclaimed them with cries of "Welcome, thrice welcome!" They were greeted in this manner along the way until they reached Richmond. Their expected arrival had been the "engrossing subject of conversation" in Richmond. Telegraphic dispatches heralded their arrival, and extensive arrangements were eagerly made to give them an "Old Virginia welcome" and reception. The Richmond Medical College Guard, composed of students, marched to the railroad depot and were there joined by the Governor's Guard, the Armory Band, the faculty of the Medical College, members of the Southern Rights Association of Richmond and Henrico, members of the Legislature, City Council and others. Citizens thronged the streets and sidewalks, and a large proportion of the crowd was ladies, despite the fact that ladies of the city were not accustomed to appear in the midst of large assemblies in the public streets, but they were in this instance determined both to maintain the honor of the South and to contribute to the enthusiastic welcome of the seceders.

Upon the arrival of the train at the depot, the band, in readiness for the moment, struck up "Carry Me Back to Old Virginny," and the multitude went wild. The "two hundred" students stepped from the cars, formed a line, and, with a detachment of the Governor's Guard (Cavalry) at its head, the procession moved to the Governor's mansion, cheered along the way by crowds of enthusiastic handkerchief-waving ladies and fired by the continued playing of "Carry Me Back." Arriving at the Governor's house, the procession found grounds and the main avenue leading to the house filled with throngs. The front porch and steps of the mansion were occupied by men and boys and a number of ladies. The crowd greeted Governor Wise's arrival upon the porch

with three cheers. The Lieutenant Governor, Speaker of the Virginia House, and other members of the Legislature took positions near him. Governor Wise then made the following address:

Sons of Virginia, who have come back among us from Philadelphia—("Higher up!"—"Go on the top of the porch." The Governor then took a position on the platform of the portico.) Sons of Virginia, who have come back to Virginia, we welcome you. You have returned to a nursing mother of whom you may be proud. She has populated the South and the Southwest, and has given to the nation the whole Northwest. She has sent her sons to the North to live and to learn. She has given to the nation her children, her treasure, and her blood, and such talents and virtue as never have been given to a common country—from Washington down. She is bound to the Union by her true devotion and self-sacrifice. What would have exhausted any other people has built up the nation, and she is still a nation with a million and a half of population. Every State of the Northwest is her offspring by deed. Her professional sons have been in the habit of going to the North to learn the art of curing diseases. Would to God that the only disease in the country was a natural and medicable disease, such as preys upon the flesh of the children of men. Art could reach such a disease. What is it that now affects the country beyond fever, beyond epidemic, beyond the art of the Faculty. What is it that possesses this nation, but yesterday blooming and vigorous as a young Hercules? What is the matter? This nation founded by fathers more noble and glorious than those of Greek or Roman grandeur—this Republic of confederated States. What is it that makes its parts now fly apart? Fly apart! Oh, God, this looks more like dissolution, more like political death, more like the destruction of the work of Washington than anything I have ever seen before. Two hundred of Virginia's children returning from another State! We welcome you with warm hearts. You will be taken as to the bosom of a mother. Why, why could you not live in the midst of a sister State?

I say, without affectation, without stage trickery, that at this moment, I feel a heaviness of sadness which I have never felt before. Churches I have seen separated, for sects will differ; but the drum of ecclesiastics is not the tocsin of bloody war, in which "red battle stamps its foot, and the nation feels the shock." The logomachy of the pulpit is a sectarian controversy. It may be a difference between the elect and the Arminian, or between Protestant and Catholic. These wars are worn out. The separation of churches did not alarm me.—But what do I see now? Without distinction of party or creed—as one mass—I see our people separating. As I have already said to-day, my friends, I say to you, here, that I mean to stand by my State, by my neighbors, by my individual rights, by my right of property and of person; above all, by my moral right of honor, and last, but not lease, I mean to stand for my political rights, the highest of which is the Constitution and the Union.—(Applause.) I say, if any Black Republicans,* Abolitionists, fanatics, fools,—worse than fools; if the wicked among the masses, or in the high places wish to take this Union, I will fight first. (Applause.) If the Union is to be dissolved they shall do it; not I. (Loud applause.) Before any other flag should float over that capital, and over us, than the flag of the Revolution, the flag of the last war, of the Mexican, and every war which may yet be fought, they shall be driven from the country. (Applause.) You can preserve it. Jackson said, and I may repeat. It must and shall be preserved—by force of arms, if necessary. (Applause.)

You did right, my friends, in returning home. Virginia has contributed her blood, treasure, and intellect to the country. Now, let her call back her own. You have come and we embrace you with open arms. Let the Legislature now extend its aid to our colleges and schools. Let us employ our own teachers, who will teach our own doctrines. Let us wear the wool from our own pastures. Let us eat the flour from our own mills, and if we can't get that let us eat our old accustomed corn bread. (Laughter and cheers.) Let us wear jeans. At the North they have made our clothes pins, our broom handles, our engines, and even our Doctors have been made there. (Laughter.) Everything nearly, in our parlors come from the North—on the mantel piece is the Yankee clock. I won't advise you to break them because you paid for them, but I will advise you to do without them in future—doctors, broom handles and all.—(Laughter.) Make them yourselves.

They are boasting that they have 18,000,000 of men against our 8,000,000. Well, it may be so, but if we have not the population of the pent up workshop, we have the hearty, unsophiscated men who have been reared in the pure air of the corn-fields —the workshops of Heaven. We have men who have not degenerated. If we had men of old who would fight, we have them now; and if we had men of old who could appeal to the hearts of the people, we have them now; and we have men with hearts to be appealed to. (Cheers.)

Here, in this metropolis, we have an institution for you, gentlemen, right where God made the snake root to cure the Ague and fever. (Laughter.)

* Formerly, a member of the Republican party, derisively so-called in allusion to his opposition to Negro slavery.

We have an University, a Faculty, an Hospital. Can you tell me why it is that Virginia doctors can't learn at home, instead of spending millions at the North to learn how to cure diseases. (The Governor then related two anecdotes, intended to illustrate the importance of patronizing Southern colleges and schools, etc.) Let us be self-reliant, self-dependent, and then, if those people of the North, who undertake to play the part of "petty Providence" for God himself, will not learn to let us alone, we have got to make them. If we can't do it without war, you doctors know that a little phlebotomy—a little blood-letting will reduce a fever. (Laughter and cheers.)

As an independent citizen of Virginia I say that if the tocsin of war must be sounded, if we must buckle on our armor, this nation alone shall not feel the shock.—The real root of the disease is the power and influence of Great Britain. The intercourse between old England and New England has produced a sympathy which is stronger than that existing between us. If this Union is to be dissolved let New England go over to Canada. I mean to stay here, unless the war crosses the border, and then, if I can get 10 men or 100 men, to follow me, whether the Legislature assents or not, I will go North. (Cheers.)

That bad man, Wendell Phillips, and that worse than Phillips, that Senator from Massachusetts (Wilson) who countenances Phillips, says that our slaves have the right to throttle their masters, and to make their way to Canada; and that if the slave, with his hands dripping with blood was to knock at their door, on his way to freedom, the door would be open to the bloody hand.—When such sentiments as these are delivered, in New York, with a guard of seventy-five police, it is time for Virginia students to come home to pursue their studies in peace, and if they cannot do that, to exchange their vocations of peace, for the panoply of war. I am not speaking against the whole North. Come what will—the worst. I thank God there are patriots in the North who will help us to give them their hands full at home. If war must come, they shall not fight it here. It must be carried to Canada, even to England. Let England no longer furnish an asylum to Fred Douglas, the negro who complains that he fears Governor Wise, aided the Federal authorities (aided by the Federal authorities?) will "bag" him. My hemp shall never be manufactured into "bagging" for him; it shall be made into a rope. If it were in my power, rather than strike at the hearts of the men of Massachusetts—of the North, I would tender them the alternative of a war with England. If I had had a low, black, rakish armed steamer in Hampton Roads, I should have ordered it to the banks of Newfoundland, with the order that if any British packet should start to England with that negro (Fred Douglas) on board, to take him, by the Eternal God! I would have given positive instructions not to hang him until I had the pleasure of seeing him well hung. Then if Queen Victoria had called upon Mr. Buchanan, for reparation, I would have told him to do as he said he would at Harper's Ferry. (Laughter and applause.) If they had demanded that "madcap Governor," I would have told them "come and take me," and if my people would surrender me, I would go without a fuss....

(A voice: "Governor, would you declare war in 1861, if you are elected?")

All I have got to say in reply to that is, just try me. (Laughter and cheers.) If you want to find that out, just put me in the White House, and I wont let a Virginia Governor rattle his regiments past my windows three times, without poking out my head and asking, "Brother, what's the matter?" (Renewed laughter and cheers.)

... May you, young gentlemen, prove a blessing to your State. May you cure her diseases in peace, or apply the lint and tourniquet in war. I hope that the God of nations will still guard and preserve this nation in peace, or if war comes, that He will preserve our half, and give us strength to bear the brunt of any trial we may be called upon to meet. Let every man in his private walks provide his arms and equipments; but, above that, let him prepare himself in soul for a crisis like this. We must all be prepared.

There was a short speech of response by a student (T. F. Lee), expressing thanks for the welcome and disavowing disunion. The reason for the homecoming, he said, was to help build up Virginia institutions, which the students would defend with willing hearts.

Mayor Mayo then spoke a few words of welcome, after which there was an exchange of "wise-cracks" between him and the Governor. The students and their escort, followed by a large crowd, then marched to the Medical College of Virginia and took seats in the lecture room. The faculty and other prominent citizens, as well as Drs. Luckett and McGuire, appeared upon the platform and there was loud cheering. After music by the band, Professor C. B. Gibson began his speech of welcome to the boys, by quoting six lines from Scott, beginning, "Breathes there the man with soul so dead..." He said that the oldest citizen

had never seen such excitement as that caused by the report that the lads were coming home. He would not disparage Philadelphia or its colleges, but he knew that only inhospitable treatment drove them away. His remark that he knew that the students must be hungry and that they would soon adjourn for refreshments was greeted by a voice saying, "Good!" (Great laughter, cheers and applause).

Professor McCaw then spoke to the assembled students, telling them that they could matriculate next morning at the Medical College, and that they would be allowed to attend the lectures until the end of the season without charge (Tremendous applause.) The band played "Home, Sweet Home," and then the students marched in a procession to the Columbian Hotel, "amid the continued cheering of citizens assembled on the sidewalks." At the Columbian, rockets blazed, every window was lighted up, and people cheered from the porch. When the students arrived in the dining room, the Mayor began a speech, but after a minute or so the sound of a knife striking a plate made everyone "fall to" upon the food, ignoring His Honor. Many prominent citizens were present at the supper and the food and entertainment were varied and superb. Unbounded hilarity prevailed, amid toasts of "Here's to us." Drs. Luckett and McGuire made speeches.

The diners adjourned to the front of the building, over the door of which an immense "national flag" floated in the breeze, and a mass meeting followed. There were speeches from a window, by professors, students and citizens, fervently declaring devotion to the South and to the Union. Marmaduke Johnson, Esq., was loudly called for. He poured out his eloquence upon the theme of the patriotism of the students, whose return was for the purpose of defending the Constitution and of being educated as Southern gentlemen, who were true to the Constitution. (Tremendous cheering.) For two hours the patriotic harangues continued, reiterating the point that Virginia would show the North that it was in earnest and would not permit "that spirit of aggression which would manifest itself in the murder of our wives and children." The God of battles would fight on Virginia's side, and the graves of patriots would be the altars of freedom. Virginians loved the United States, but would see the Union blotted out of existence rather than see Virginia dishonored, cried one of the speakers.

After all of the excitement of the day the students finally got to bed at the Columbian, the St. Charles and other hotels and at private residences.

(They did not forget to pass separate resolutions thanking everyone, from the Governor down, even including the citizens of the southern cities through which they had passed en route, for their hospitality, and one resolution unanimously called upon all Southern medical school students in Philadelphia and New York to leave their schools and continue their studies in Richmond, in common defense of their rights, as a "consolidated phalanx.")

Newspaper reaction at home was swift and spirited, reference to the return of the seceders being made in terms of their being "sore wounded at heart at the unwarrantable outrages, both of word and deed, perpetrated by the fanatics of the North on an unoffending people." The entire story of the homecoming was reported in great detail by *The Richmond Whig* and *Richmond Enquirer.*

Some editorial comment in Philadelphia, while courteous to seceders, pointed out that although it was an excellent thing for young citizens to wish to return to their own section and build it up, a greater measure of respect and honor should be paid to the men who did not leave in the first place but remained at home to carry out the same ideal. Called into question was the wisdom of the ovations, the speeches by the Governor

and others, the free train passage to Richmond, the grand banquet, and red ribbons worn by the students as badges of honor, the handkerchief waving by the ladies and the application of such terms as "noble," "gallant" and "honorable." The students who remained at home had not frolicked, nor passed resolutions, nor been honored, dined and cheered. Yet their conduct was at least as worthy, and their medical studies had not been interrupted. On the other hand, the seceders, it was pointed out, would lose out, not only because of the violent interruption in their studies, but because such adulation would probably turn some of their heads. The press pointed out that it was pitiful to see Southern feeling and Southern strength wasted on such futile acts, for a good cause could be damaged by being made to look ridiculous.

A news report in one of the papers of the South ran to the effect that three hundred medical students studying at Jefferson

> ... took counsel together and *una voce* determined that they would at once turn their faces homeward.... Sad, very sad, is it that ere this grand Republic had come to be one century old, cause should arise for such a step, but the cause has arisen and the step was unavoidable, and upon the heads of Northern traitors be all the consequences thereof.

Another, dealing with the reception for the students, said:

> ... He, (Dr. Gibson, Professor of surgery) knew some of the causes that prompted their action, but the principal cause was that they were inhospitably treated.... Every citizen in Richmond believed they had done right in quitting Philadelphia ... and when he said that, he said the truth, and what was accessible to every ear and heart in the Hall.

The Maryland and Virginia Medical and Surgical Journal for January, 1860, ran an editorial (pp. 84–87) in which the North American Medico-Chirurgical Review, edited by Dr. Gross at Jefferson Medical College, was quoted as saying (on the subject as to whom to blame for the "secession"), "as we ourselves have no authentic data to guide us, we shall, for the present, forbear from any further comments." Then the Journal continued:

> ... It would be unnecessary to add a word to the above extract, but that some of the Philadelphia press have charged the Faculty of the Medical College of Virginia with having suborned Drs. Luckett and McGuire, by promises of preferment, to tamper with the class and instigate an excitement calculated to advance the interests of their school. It is hardly necessary to give to that charge the promptest denial ... there was not the remotest idea of such a proposition until four days before the withdrawal of the students.
>
> Again, to suppose that Drs. Luckett and McGuire could have been tempted to produce the movement by promises of places which do not exist, and with prospects of rewards which can never equal those just abandoned, would be to attach the double charge of treachery and folly to gentlemen who do not need any defence at our hands from such intemperate allegations.

Finally, it stated that not one of the students had returned to Philadelphia, and the Journal reported a resolution by the secessionists, dated January 23, 1860, in which it was stated that 257 had left Philadelphia in December, and from 50 to 75 more had followed less than ten days later, (and that, of the whole number, about 275 were from Jefferson and about 40 from the University of Pennsylvania). Furthermore, it was happily announced that "the movement has met the cordial and emphatic approbation of our parents or guardians and the enthusiastic endorsation of the whole South, with scarcely a dissenting voice." Another resolution ran:

> ... we have realized the fact, that the Faculty, in point of practical ability to instruct in all branches of the profession, are fully equal, if not superior to those of the Northern schools we left, and, in some respects, the facilities of medical instruction are greater ...

Secession in New York

Philadelphia was not alone in this outbreak of secession fever. New York stu-

dents also seceded, as the following newspaper clipping states:

New York, Dec. 23, 1859. My impression is that the feelings of this community have never been so thoroughly harrowed up, nor the public bosom so ruthlessly rung, as it was yesterday, when the people were notified, through the public journals, that twelve young medical students had publicly proclaimed it to be incompatible with their "views" of patriotism any longer to pursue their professional studies in this city or at the North. This heart-rending transaction was not consummated until after an immense amount of gab had been indulged in by the young Aesculapians, and an indefinite number of pathetic appeals made by older "pukes" and professors of the University. When the tocsin was sounded for those to come forward to the rostrum who were willing to wipe off the mud of New York from their brogans, and turn their noses to the sunny South, only twelve responded to the appeal, and of these, it is hinted, that two only have enough putty in them to stick to the programme. The youngsters did the handsome thing by their Philadelphia brothers—approved of their conduct, endorsed Charles O'Conor's speech, put Helper through, and were strong on Ossawatomie. After blowing off steam, they appeared to feel a great deal better, and with cheerful countenances and firm step, all went round the corner and took something. The city feels hurt about this. To lose these twelve young people is something serious. The boarding house-keepers, especially, are shocked at it. Medical students are so proverbial for orderly conduct, prompt pay, tidiness in their rooms, and so notoriously hostile to tobacco, beer, and things of that nature, that the loss of the salutary influence of their daily (and nightly) walk and conversation will be a sad drawback upon the morals of the rising generation. What's to be done? The exigency is a trying one, and has piled up an extra heap of danger about the Union business.

Another item noted as follows:

ANOTHER MOVEMENT OF MEDICAL STUDENTS

The Southern medical students at the University of New York held a meeting in Fourteenth street, in that city, on Wednesday evening, which some persons, apparently not of the number, but who intruded themselves for other purposes, attempted to convert into a means of injuring the medical colleges of Philadelphia and benefitting that of New York. In proof of this we need only cite some of the proceedings. Here, for example, are two resolutions:

"A resolution approving of the action of the Philadelphia Southern students, under existing circumstances, and declaring that their return home was calculated to promote the interests of the South, was received with applause and unanimously adopted. "Another resolution was then offered, declaring the University of New York equal to any in the Union, and deploring the necessity which could induce the students to leave it. The resolution also spoke in terms of praise of the professors of the college."

On the last resolution a vote was not taken. There were present many persons opposed to a secession of students from the University of New York, but not one of these raised his voice to deprecate the action of the students in Philadelphia. Speeches against the students leaving New York University were made by various doctors, one of whom was connected with Bellevue Hospital. Another, who may perhaps have some personal interest in the result, is thus reported:

"Dr. Kiernan said that inasmuch as he loved the South and would defend its rights, yet he must disapprove of this movement. The students of Philadelphia had done right, because twenty-five were put in prison, in a calaboose, and otherwise insulted. Has anything of the kind been attempted against Southern students in New York? No, sir. This grand centre of trade and commerce stands firm for the Union, for the doctrines of Washington, of Calhoun and of Jackson, and if such outrages were perpetrated on southerners they would not be tolerated for an instant. The doctor then eloquently described the recent municipal contest of Fernando Wood against the black republican and mongrel candidates for the Mayoralty, showing how in spite of money, bribery and corruption, the popular man who was heart and soul for the Union had been triumphantly elected. (Great applause.) The University itself was pro-Southern in its feelings, which was a strong reason why the South should support it. He concluded by declaring his conviction that if the occasion ever arises, there will be fifty thousand bristling bayonets marching from the North to oppose the progress of abolition, and there would be plenty of Northern men like himself to drive back any foe that might come. (Great applause.)"

This person, whoever he may be, fabricated an outrageous charge, for the purpose of exciting prejudice against Philadelphia. It is not true that twenty-five medical students were arrested here. There were not twenty arrests altogether at National Hall, and of these the majority were Philadelphians. The concluding proceedings in New York were as follows:

"It was eventually resolved that those gentlemen who were in favor of seceding from the college and going south should ascend the platform, when

fourteen students, obeyed the direction, and registered their names as the pioneers of those who will secede. It is expected that others will shortly follow. The resolution and action of the fourteen were received with applause.

"The following dispatch was received and read to the meeting, in reply to a message which was sent by the students of the University:

New Orleans, Dec. 21, 1859.—Messrs. Phillips and J. B. Hinkle, University Medical College, N. York; The Faculty of the New Orleans School of Medicine sincerely regrets that you have found yourselves under the necessity of leaving the school to which you are attached. They will receive you on condition that you pay matriculation and graduation fees. Please acknowledge receipt. E. D. Felner, Dean.

"Our reporter was informed that in consequence of the persuasions of Dr. Aylette, of the South, many of the students declined for the present to join in the movement for leaving the University.

"There were about three hundred students present at the meeting."

We cannot refrain from expressing our gratification at the manly letter from the faculty of the New Orleans Medical College. They have exhibited a spirit to which the paltry doctors who figured at the New York meeting seem to be utter strangers.

A third report stated:

Trouble at the New York University Medical College.—The students of the College held a meeting on Friday evening, to consider an alleged indignity offered to Prof. Aylette, by President Draper. The Professor, who is blind, is a native of Alabama, and a sort of private tutor for the Southern students of the College. He is said to have acted for many of them as confidential agent. The letter of the President of the College, conveying the offensive imputations complained of, is as follows:

Dr. Aylette—Dear Sir: Will you please give me replies, for the use of the Faculty, to the four following questions?

1. Have you informed any student that it is not necessary to take out his tickets at the beginning of the session, and that the Faculty did not require their fees until Christmas?

2. Have you taken money from students who had brought it to New York for the purpose of paying their college fees, and invested it, for your own profit, with business men?

3. Have you, after receiving New York funds, given to any uncurrent notes at a heavy discount, keeping the difference for your own use?

4. Have you failed to repay any student who had deposited his money for safe keeping, on the excuse that those to whom you lent it were unable to keep their engagements with you?

Your early reply to those questions will greatly oblige

Yours truly,
J. W. Draper,
President Medical Faculty N.Y.U.M.C.

The students adopted resolutions sustaining the Professor, and indorsing him as an honorable man, above all reproach.

On Saturday afternoon a meeting was held for the purpose of ascertaining how many of the students would go South with Dr. Aylette in the Marion, which sails on Wednesday. Fifty-seven the students signed the list, and it is said the number will be larger. The owners of the steamship line have agreed to take them at a reduction of $2 per capita. Dr. Aylette made a few remarks, in which he distinctly stated that this action was not a secession movement, in a political sense. In conclusion, he bade them an affectionate adieu, and said, if they should never meet on earth, he trusted they might meet in heaven.

Several of the students have already left the College. Three went on Saturday to New Orleans; some have gone to the Twenty-third street College; others design going to the Nashville College. So the matter rests.

Why were the students in New York, unprovoked by arrests and imprisonments, ready to leave a friendly and unoffending city? While it is true that Dr. McGuire gave a warmly sympathetic ear to the plan, it is not necessarily true that the movement to return to the South should be ascribed to his blameworthy activities alone. Sectionalist feelings were in the air and were exploited by certain political personages, some of whom were capable of so distorting facts. It is clear that there was intense desire to build the economy and the facilities for medical education of the South, as we shall presently see. This was too wide-spread an ambition to place upon the shoulders of one man. Dr. McGuire, whose honor should not be so lightly impuned, did not immediately take up a post of professor in a medical school of the South, as charged, but matriculated, instead, along with 140 returned students, at the Medical College of Virginia, at Richmond, and won his second M.D. degree in 1860 (4). In later years, Jefferson Medical College honored him with an

LL.D., as had the University of North Carolina earlier, and he served as president of both the American Medical Association (1892) and the American Surgical Association (1886). Noteworthy is the fact that, while serving as medical director of the Army of the Shenandoah under "Stonewall" Jackson, he "established the principle of treating medical officers as noncombatants, allowing those of the enemy to remain with their wounded and to return to their command after these were cared for. From that time until the advent of the World War, this humane principle was adopted by the entire civilized world as a principle of warfare (6)."

In the absence of additional facts, it is not possible to make out so favorable a case for Dr. Luckett, innocent though he may have been. And Governor Wise's incendiary speech could only add fuel to a fire already raging. The "public" did its share to further the secession, the project of bringing the boys (6) back to the South being supported by "appropriation and public subscription," in Richmond. The funds thus raised were used to reimburse the students for the costs of transportation to that city (7). George M. Gould (8) tells us that:

"From Richmond, the capital of the Confederate States, there was made a request upon the Southern medical students in Philadelphia to withdraw themselves from the schools of the latter city and enter those of the former. They were promised the same relative standing; and more, they were promised instruction gratis. This influenced them and determined their course of action..."

Yet, before the Civil War was over, Southern students, including some who had seceded, began to return to Philadelphia and Jefferson Medical College. Even with the war going badly for the Confederacy, there was not sufficient alleged bitterness against the city to nullify either their affection for it or for the College. The "devil" which Dr. Gibson thought had possessed the students consisted partly of the preliminary high tensions of the Confederacy, partly of the emotional consequences of John Brown's raid, partly of the bitter feelings of the students, and partly of appeals to their patriotism and sectionalist loyalties.

Demand for Southern Medical Schools

A campaign by the medical schools of the South to encourage medical students to attend schools in that area had been going on for a number of years. As early as 1848, a statement made by the Medical Department of Hampden Sidney College (9) expressed regret that students from the South sought education elsewhere:

... Indeed it may be safely affirmed, that no people have ever become highly distinguished in any given department of knowledge, whose sons have had to seek the elements of this knowledge abroad. Literature and science are eminently social. They flourish by communion with the parent source; transplanted and isolated they languish and die. Hence the importance of establishing and maintaining the nurseries of knowledge in our midst. History confirms the dictates of reason in showing that wherever institutions of learning have fluorished, there the diffusion of intelligence and refinement have been most general and their useful fruits most abundant. The resort of the youth of Virginia to other states in pursuit of education, and the withholding from our own institutions of the patronage upon which the extension of their means of usefulness depended, have long proved the greatest hindrance to the growth of science at home. This practice, disreputable, it must be confessed to the commonwealth, and impoverishing to her pecuniary resources, has excited the solicitude of some of our most distinguished patriots and statesmen, on grounds to which we cannot be indifferent at the present moment. Mr. Jefferson, writing 1821 (Vol. 4, p. 342, Corresp.), at the time of the Missouri controversy, holds this language: "The line of division lately marked out between different portions of the confederacy, is such as will never, I fear, be obliterated; and we are now trusting to those who are against us in position and principle, to fashion to their own form the minds and affections of our youth. If, as has been estimated, we send three hundred thousand dollars a year to the northern seminaries for the instruction of our sons, then we must have there five hundred of our sons,

imbibing opinions and principles in discord with those of their own country. This canker is eating on the vitals of our existence, and if not arrested at once will be beyond remedy. "... Notwithstanding the merits of the medical department of the university as a preparatory school, it is well known that from a deficiency of practical advantages the great majority of the medical students of Virginia resorted to the institutions of the northern cities, without previously attending a course of lectures at our university. This class of students, it was supposed, might be attracted to Richmond by a school organized on the plan of the northern schools, and presenting the advantages for practical anatomy and clinical instruction which could be offered them in a populous city. Accordingly the Richmond Medical school was organized in 1838.... Your memorialists then may claim to have done something towards arresting the resort of Virginia's sons to other states for medical education. Still, they regret to say, much yet remains to be accomplished. The "canker" is still eating upon our vitals, to an appaling extent. The catalogues of the University of Pennsylvania and the Jefferson medical school of Philadelphia show that 184 Virginia students were attending the lectures in these two institutions during the last winter. Adding those attending the other schools of Philadelphia, and the schools of New York, Baltimore, Louisville and Lexington—estimated from the best sources of information at upwards of 40—we have a total of not less than 225 Virginia students in pursuit of medical education abroad. Independent of other weighty considerations, in part adverted to, the subject is not unworthy the attention of your honourable body in its economical bearing. These 225 students expend abroad on an average $500 each, or an aggregate of $112,500 per annum. For this large sum annually carried out of the state, no return is made which ought not, and your memorialists may be permitted to say which might not, at the present moment be equally well secured within our own borders. Expended at home for the same objects, it would be distributed among our own citizens to add by its amount to the aggregate wealth of the state.

Some years later, another publication (10) made the same point:

The teachers of medicine in Virginia annually set forth to Southern students the advantages of deriving instruction from southern institutions. They dwell, with justice, on the fact that the parallelism between many of the diseases of the North and South is not identical, that our climate engenders distinct causes of disease and modifies its progress; they speak of the difference in constitution of the white and negro; they call attention to those diseases which are peculiar to the South; to that malarial element which the southern practitioner must ceaselessly combat in all its protean developments, and by these and similar arguments, enforce the truth, that while the principles of medicine are uniform, its practice must be learned in the locality in which these principles are to be applied. The medical and secular press, learned association-orators, and a discerning public, not only repeat these scientific considerations, but appeal to other motives, and yet the number of Virginian medical students at northern schools, who turn a deaf ear to these addresses to their patriotism, self-respect, and sense of expediency, considerably exceeds the whole number of pupils in attendance on the medical colleges in our State.

The causes of this deplorable condition of things are manifold. The attractive pleasures of large cities, the prejudice of physicians which sends their pupils to the institution in which they themselves were taught, the traditional excellence and sound doctrine of the "old school" of Philadelphia, the rhetorical and operative display and facilities for obtaining diplomas at "the Jefferson," and the clinical advantages which, according to the "Stethoscope," are enjoyed by students in New York, these, doubtless, are some of the considerations which induce Virginian medical students to forsake the institutions of their own State. On the other hand, it must be confessed that Virginia has never had a medical school enjoying the cordial and unanimous support of the profession.

The rise of medical schools in the South, prior to the Civil War, was part of the general cultural advance which was taking place throughout our country at that time, but these schools also arose as a result of the urgings of Southern nationalism which followed the beginnings of agitation for abolition and unpleasant sectionalism (11).

We have taken note of the fact that the Maryland and Virginia Medical and Surgical Journal, after quoting the North American Medico-Chirurgical Review, rose to the defense of Drs. Luckett and McGuire. Two other journals entered the lists against the Review. The first was the Nashville Monthly Record of the Medical and Physical Sciences (12). This journal denied the implied allegation by the Review that the Shelby Medical College of

Nashville had corresponded with the dissatisfied students before they had decided to leave Philadelphia, although two students from among that group entered Shelby upon their return to the South, one who had taken his first year there, and the second student, a friend of the first, who desired to be with him. The editorial concludes as follows:

> . . . We do not consider that any one is entitled to impugn the motives of the students; they had a right to consult their own feelings; and we can well conceive that when political animosities ran so high as they did last December in Philadelphia, Southern young men of sensitive spirit might be made to feel by a thousand small annoyances, not one of them of much weight taken by itself, that that city was no congenial home for them; it is their business; we have nothing to do with it but to welcome them home, which we do with all cordiality.
>
> We can only conclude by reiterating our opinion, long ago expressed, that the Southern colleges (apart from all sectional squabbles) are the right place for Southern students; but believing this ourselves, we recognize them as free agents entitled to exercise their own judgment in the matter; we despise and abhor the electioneering and drumming which has most unfortunately become an established practice in so many of our Medical Schools, and of which, unless we are much misinformed, Philadelphia herself has by no means been able to keep her skirts clear. The College to which we are attached might, we believe, have increased her numbers faster than she has done by joining in such practices, but prefers to wait for the patronage which she believes will result from the advantages she offers. Finally, we tender our sincere sympathy to the Philadelphia Faculties under the annoyances which all admit are not incurred by any misconduct on their part.

(The editorial also expressed the same sense of shock at the seemingly unwarranted accusations against Dr. Luckett and McGuire, as did the editor of the Maryland and Virginia Medical and Surgical Journal.)

The other journal which disputed the Review was the New Orleans Medical News and Hospital Gazette. The Review of March 1860 referred to the account of the "secession" which it had published in its January number and said that it did not wish to return to the subject, but, since Dr. Bowling had denied, in the February number of the Nashville Journal of Medicine and Surgery, that he or his colleagues were in any way guilty of sympathetic behavior towards the stampeders, the Review felt that it ought to point out that its notice was only of an historical character, and that it was based upon information from various sources, all of them, to its knowledge and belief, trustworthy. The data regarding the University of Nashville, were based "partly upon the statements of members of the class of Jefferson Medical College playing a prominent part in the stampede, and partly upon the annexed telegraphic dispatch, dated Nashville, December 20, 1859, and addressed to a medical student in this city: 'Yes, come one, come all. W. K. Bowling.'" Now Dr. Bowling is correct in saying that no word from him was read to the students on December 20th, for the message did not arrive until after the meeting had adjourned. Yet it did reach here before the students left the city, and "was no doubt extensively circulated." The editorial further absolves the University of Louisiana from having had any part in the movement, and quotes Dr. Richardson, professor of anatomy there, as declaring, on behalf of the entire faculty, that it was opposed to the proceeding and denying that any kind of communication had been sent by the faculty, either before, during or after the stampede. The Review also took note of the fact that, as we have already seen, the Shelby Medical College entered a similar denial. Aware that the medical schools of the South were being accused of complicity in the movement of the students southward, the New Orleans Medical News and Hospital Gazette (Volume 6, p. 850) stated that, were it not for the circumstances which now excite our citizens, it would not take notice of such a charge. The success of the New Orleans School of Medicine was based upon its

fair and honorable dealing, the fact that its morals were correct and the fact that it had no interest in arousing feeling for the return of the boys. However, when a telegram arrived, expressing determination of the students to leave the North, and asking the terms upon which they would be accepted by the New Orleans School, the latter felt that it could not close its doors upon them and answered that they would be permitted to complete their studies and would be required to pay only matriculation and graduation fees. It also lamented the state of affairs in which students would wish to leave Philadelphia:

> . . It evinces a lamentable difference of opinion on vital questions concerning our country's welfare, before which consideration all others sink into insignificance. We deplore it, and wish from the bottom of our hearts that young men who have attached themselves to northern schools this season could be content to remain and receive that for which they have paid and which will be so well bestowed on them . . .

The News and Gazette (Volume 6, p. 935) quoted the Chicago Medical Journal as expressing its regrets, if the movement resulted from political causes, but, if the return was motivated by a feeling that it had been a mistake to pass up the schools of their own area for those of Pennsylvania especially, "we cannot but commend their judgment." The Journal added that it thought that the medical schools of the Southern cities suffered nothing in comparison with those in this or foreign countries:

> . . We have long believed that a more equal distribution of students among such medical schools of the country as possess facilities for clinical instruction instead of gathering 500 on the seats of a single lecture room, would be for the advantage of all concerned . . .

It hoped that Western students would likewise study in their own areas, for, if Western schools were not now fully equal to any others, only patronage was required to make them so. The News and Gazette remarked that the taunt of sectionalism could not force the editor from his position that the South afforded every facility for medical education that could possibly be offered by the North, because both undergraduate and graduate study in New Orleans now had advantages not equalled elsewhere in the land. The statement ended with the comment that New Orleans had "resolved never to stain our escutcheon by descending to political or other intriguery. We deserve the patronage of our youth, and we know they will shower it on us."

Shortly therealter, the Gazette (Volume 7, p. 119) returned to the fray. The editor said that he had hoped that all Northern medical journals had by now vented their fullest measure of spleen against Southern medical colleges, but that the Review of March 1860 was again stirring up the pool and blaming the schools of New Orleans, except the University of Louisiana, for opening their arms to the disaffected students. (The Review, January 1860, reported that telegrams and letters from Governor Wise and the deans of medical schools of Richmond, Charleston, Savannah, Augusta, New Orleans and Nashville had been read to the students, tendering sympathy and a cordial welcome.) The Review, in the judgment of the Gazette, had never given a *true* history of the secessionist movement. The Gazette then gave its version of the history, maintaining that the only connection which the New Orleans School of Medicine had ever had with the students was to receive a dispatch from New York City, signed by the "Alabama Committee," asking terms upon which it would accept seceders, to which the School answered with the usual expression of regret that they felt it necessary to leave the North, and offering to accept them upon payment of matriculation ($5.00) and graduation ($25.00) fees.

The Faculty of New Orleans School of Medicine, said the Gazette, "never had, at any time any communication of any kind whatsoever with any student of medicine attached to or seceded from any school in Philadelphia."

On December 22, 1859, the students at the University of Louisiana held a meeting, S. J. Luckett presiding, at which full approval was given to the course taken by the seceders because "we do not receive on the part of the North the respect due . . . citizens of the United States," and it was therefore their duty, as men of the South, to support Southern institutions, so long neglected, instead of those of the North.

The disturbance did not quiet down. The *New York Herald,* on January 13, 1861, referred to a "grand blow up among the teachers and students in one of the New York colleges." Once again secession was the order of the day, and Southern students were described as follows:

> . . . long-haired, lantern jawed, verdant youth, afflicted with chronic salivation and inveterate profanity. Reared in the semi-savage solitude of a remote plantation . . .

The Civil War was, indeed, on its way.

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(A portion of the data, and quotations used in this study are drawn from unidentified clippings in the Pamphlet Collection of the Library of The College of Physicians of Philadelphia.)

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The George M. Coates Memorial Lecture

George Morrison Coates, M.D., F.A.C.S., Distinguished Otolaryngologist, Teacher, Editor and Author: Whose Philosophy of Medicine Could Contribute So Much to Our Program of Health Care in These Coming Days[1]

By FREDERICK T. HILL, M.D.[2]

I AM very appreciative of this invitation to deliver the George M. Coates Lecture. While I have had the good fortune, over the past 50 years, of knowing intimately most of the great leaders of our specialty, two have occupied special places in my memory: Dr. Harris P. Mosher and Dr. George M. Coates. I grew up professionally under the tutelage of the former, and I have had the privilege of an enduring friendship with the latter. Both were devoted teachers, prolific writers and excellent clinicians. Dr. Mosher was perhaps the more dynamic and more active in research, while Dr. Coates excelled as an editor and author, contributing over one hundred scientific papers of sound value. His teaching methodology was unique and most effective, being characterized by sympathetic, friendly understanding, always encouraging to the younger man. He particularly excelled in post-graduate teaching, attracting students from all parts of the country.

There should be no need here in Philadelphia for me to enumerate all of Dr. Coates' many contributions to our specialty or the numerous honors he received. Born of Quaker ancestry on March 24, 1874, except for the time he spent in the military service of his country, he always lived in Philadelphia or its environs. Two of his ancestors were among the founders of the Pennsylvania Hospital, the first hospital to be established within the Continental United States. After receiving his degree of Doctor of Medicine from the University of Pennsylvania Medical School and serving various internships in the Philadelphia region, he began the study of otolaryngology with Dr. Francis Packard at Pennsylvania Hospital and with Dr. Walter Robertson at the Philadelphia Polyclinic and College for Graduates in Medicine. He was certified by the American Board of Otolaryngology in 1925, the first year of the Board, becoming an Examining Director in 1930.

His military service was indeed unique. As a young man, Dr. Coates served as Assistant Surgeon in the U. S. Navy during the Spanish-American War, receiving two campaign medals. Later he served in the National Guard of Pennsylvania, advancing from First Lieutenant to Lieutenant-Colonel, Medical Corps. In the first World War he was commissioned Major and soon promoted to Lieutenant-Colonel. He was Chief of the Section of Head Surgery in Base Hospitals at Camp Sevier and Camp Hancock in this country, and later Commanding Officer of Base Hospital No. 56 in France. He retired as a Colonel in the Medical Corps, U. S. Army Reserves.

He was Professor of Otolaryngology and Chief of Service in the Medical School, University of Pennsylvania and the University Hospital from 1933 to 1939, at

[1] Presented at a combined meeting of the Section on Otolaryngology, The College of Physicans of Philadelphia, with the Philadelphia Laryngological Society at The College of Physicians of Philadelphia, 6 February 1968.

[2] Thayer Hospital, Waterville, Maine 04901.

which time he became Emeritus Professor. He was also Professor and Chief of Otolaryngology of the Graduate School of Medicine and Graduate Hospital of the University of Pennsylvania, retiring as Professor Emeritus in 1954.

He was a Past-President of the Philadelphia Laryngological Society; of the Section of Otology and Laryngology, The College of Physicians of Philadelphia; of the Section of Otolaryngology, Pennsylvania State Medical Society. He served as Chairman of the Section of Laryngology, Otology, and Rhinology, American Medical Association, and as President of the American Academy of Ophthalmology and Otolaryngology; of the American Laryngological, Rhinological, and Otological Society; of the American Otological Society; and of the American Laryngological Association, as well as the Section of Otolaryngology and Ophthalmology, Clinical Congress of Surgeons of North America.

He was Chief Editor of the Archives of Otolaryngology from 1937 until his death. He was co-editor with Chevalier Jackson of *The Nose, Throat, and Ear and Their Diseases;* with I. S. Ravdin, of the American Edition of *Kirschner's Operative Surgery,* Volume III; and, with Harry P. Schenck and W. Valentine Miller, of the five volumes of *Otolaryngology* published by W. F. Prior Company.

He received the following outstanding honors:

Newcomb Award and the DeRoaldes Gold Medal Award of the American Laryngological Association. Also Guest of Honor of the Association in 1956.

Guest of Honor and Award of Merit, American Academy of Ophthalmology and Otolaryngology.

Award of Merit, American Otological Society. Also Guest of Honor of the American Otological Society in 1954.

Guest of Honor, of the Section of Laryngology, Otology, and Rhinology of the American Medical Association in 1959.

Award of Merit of the Alumni Society, University of Pennsylvania.

Dr. Coates married Mildred Aspinwall Hodge in 1910. They had two children, Elizabeth Gardner Coates, and George Woolsey Coates. Mrs. Coates died in 1954 and their son in 1955, leaving a widow and two sons. Dr. Coates' son and daughter both served in the U. S. Army in the European Theater in World War II, and his daughter, Elizabeth, faithfully served with her father until his death in 1960.

One of Sir William Osler's many aphorisms describes the ideal physician as one who "Acquires the Art of Detachment, the Virtue of Method, the Quality of Thoroughness and above all the Grace of Humility." How well this applied to Dr. Coates, whose entire career was an example of super-erogation!

May I beg your indulgence if I deviate from the usual form of address. Rather than presenting some particular scientific phase of otolaryngology, I would like to discuss with you some of the problems facing the practice of medicine and our voluntary hospital system today. These are problems resulting from politico-social developments of the past several years and culminating in recent national legislation which is, to say the least, provocative, if not appalling.

Perhaps I should qualify myself by saying that, while my professional life has been in otolaryngology, for many years I served as Medical Director of the Thayer Hospital and as such have been active in hospital association work on the state, regional, and national levels and last year completed six years service on the Federal Hospital Council.

Now may I explain my subtitle. Frankly I was searching for something that would indicate the need for certain benign influences of the past, such as were inherent in the philosophy of Dr. Coates, on a rapidly changing pattern of Health Care

and Medicine. I considered that perhaps "Quo Vadis" might be used, for it seems fitting at this time that we, physicians and all who work in hospitals, should pause for a little and give thought to "Whither we goest." These are critical times, and the future of the practice of medicine, as well as our voluntary hospital system, may become vastly different from that to which we have been accustomed and might hope to preserve. The lowering of moral and ethical standards in public circles, which seems to be generally accepted, as well as the materialistic tendency which is beginning to pervade even our own profession, certainly provides little reason for complacency. If we are to have a future worthy of our calling, we must strive to retain, and, if necessary, to recapture, the Ideal of Service which has characterized the Healing Arts these many years, so well typified by Dr. Coates.

Medicine, together with our hospitals, has been going through tremendous changes these past four decades. Hospital facilities prior to World War I were far from satisfactory and, such as they were, poorly distributed. Generally, except for the larger metropolitan units, hospitals were little more than accommodations for patients, an operating room or two, and often no laboratory facilities. Between 1928 and 1938, nearly 800 hospitals had been discontinued, as a result of the depression. The War prevented any correction of this situation, and, only after the close of hostilities, was it possible for any program for improvement to be inaugurated.

Year before last marked the 20th Anniversary of the enactment of the Hill-Burton Act which became the law of the land on August 13, 1946. Originally the program was limited to the construction of hospital and public health centers.

As time went on it became obvious that, on a country-wide basis, we were building too many acute-care beds, and, in 1955, four separate categories were added. These were for chronic disease facilities, nursing homes, diagnostic and treatment centers, and rehabilitation. In 1966, a fifth category, for modernizing older facilities, was added.

As time goes on, there has come a nationwide concern over the ever-rising cost of hospital care which seems to be reaching almost into the stratosphere. Careful studies have indicated several reasons for this.

The great technical advances of the preceding four decades have provided us with greatly improved methods of caring for the sick and injured. These advances have resulted in lower morbidity and lessened mortality. But each advance has been expensive. Scientific equipment and additional skills both cost money.

The same scientific advances which have provided us with diagnostic and therapeutic skills to save lives, almost undreamed of years ago, have of themselves posed additional problems. More lives have been saved to suffer from the inevitable diseases of old age. Coggeshall aptly describes this as having "traded the problems of mortality for those of morbidity."

In addition, there has been a great increase in the number of nursing and paramedical personnel required in the hospital, to provide this modern care for our patients. The former low wage scale of all hospital personnel was quite archaic and required upgrading. Increased wages and salaries became added factors in increased hospital costs. These causes are understandable. However, the rising specter of unionization poses additional problems, probably beyond the control of our institutions.

Another reason for increased hospital costs has been over-utilization, or misuse of facilities, constructed for acute care. At times this may be the fault of the physician who finds it is easier to take care of

a patient in the hospital than it is in his home or the doctor's office, or who may be inclined to keep a patient in the hospital longer than is absolutely necessary. Also there has been a lack of development of ambulatory or outpatient facilities. These were encouraged in the diagnostic and treatment categories of the Hill-Burton program, but frequently ignored. If developed and properly used, diagnostic and treatment facilities would make many hospital admissions unnecessary.

But the most significant factors in high cost of hospital care have been in over-construction, or unnecessary duplication of facilities.

There is a city on the Eastern seaboard in which there are several teletherapy units or cobalt bombs. Now a cobalt bomb is a very useful item in handling certain selected cases of malignancy, sometimes in addition to conventional intensive x-ray therapy. But often, and especially when duplicated, this becomes what one might call a prestige item. Careful investigation in this city revealed that the total treatment time used by these units for the entire area, on the average, did not exceed a total of one hour per week. Now the average cost of each unit is at least $100,000 with necessary replacement of the unit in perhaps five or six years. This certainly would seem unnecessary extravagance.

One could mention a large Midwestern city which has ten excellent hospitals. Eight of these ten hospitals have constructed facilities for open-heart surgery. Each unit costs a minimum of $100,000 and takes ten or more technically trained persons to operate it. It has been found that the eight hospitals with open-heart surgery facilities do not average one such operation per week for the entire city. And there have been many other and simpler examples of reduplication.

These conditions became generally recognized and led to the concept of area-wide planning for hospital and health facilities, particularly from a long range view-point. This has become very successful and has gained wide-spread acceptance throughout this country. For the most part, this is on a voluntary basis, except for New York State which has a law that no new hospital facilities can be built, even with private funds, unless they pass the State Area Planning Commission.

At the present time, area planning is largely concerned with problems of modernization of hospitals which have become obsolete and in the encouragement of building small community health centers, which can serve as diagnostic units, provide emergency care, and have ambulance service connecting to a regional center both in equipment and in medical skills.

A major concern to all of us these days is the impact of Medicare, Title XIX and other governmental programs, particularly Public Laws 89-749 and 89-239, on our health facilities and services. Obviously this is a revolutionary concept, and only after observations have been made over a long period of time will it be possible to measure, with any degree of precision, the impact of these new laws.

The most immediate problem is the lack of professional personnel, estimated today at over 275,000. All recognize the great lack of physicians which is going to take a number of years to correct. Emphasis on research, perhaps triggered by the lure of federal money, seems to have diverted the interests of many medical schools, "wrapped in a cocoon of educational complacency," from training doctors for clinical practice. Actually, the greatest need seems to be for what might be called "family care or primary physicians," as noted in the Millis report.

It is refreshing to note a changing attitude upon the part of certain medical schools in condensing the time needed to train young physicians. Johns Hopkins has a plan whereby 24 selected students

may combine two college years with five years in Medical School. Northwestern, Boston University, and Albany Medical Schools, by making use of summer months, bring the students up to internship in six years. And, Jefferson, here in Philadelphia, is planning on a five year program. The only criticisms of these plans seem to be that they may tend to direct the students more to academic medicine, or to research, than to clinical practice.

I think you might be interested in the December 1967 number of the Atlantic Monthly called "The Health Syndicate—Washington's Noble Conspirators," by Elizabeth Brenner Drew. She calls attention to a group who have exerted an extraordinary influence on all of the Federal planning for health programs. As a result of this, the National Institute for Health in Bethesda has been built into the greatest biomedical research institution in the world. She wrote:

"Three men, Dr. James Shannon, Director of NIH, the late Congressman Fogarty of Rhode Island, and Senator Lister Hill of Alabama have been leading factors in this, but most important of all has been a wealthy public-spirited lady in New York, who has developed what she calls a "stable of doctor allies" and who, together with a very prominent local society leader in Washington, has had unparalleled influence on this major area of national policy. Money, plus social position and influence has played an unusual part in the development of this program. Too often basic research has been pushed aside for medical research on a trial and error basis. Of course, this gets excellent publicity and results in a large amount of Federal funds.

"Perhaps it is not unfair to feel that too much emphasis has been placed on "Heart-Cancer-Stroke," for example. It seems obvious that this does raise some serious questions as to the medical and financial involvement in developing centers, where the most advanced treatment can only ameliorate, not cure, and can only postpone death. Unfortunately there has been a tendency to get away from basic research and go into some programs rather hurriedly. For example, the program inaugurated in 1955 on Cancer Chemotherapy has been carried out at a cost of over $250 million, with very meager results.

"Actually one might question whether the prevention or postponement of death among the aged should have the most important priority in medicine. The resources that go into research and treatment of diseases affecting the aged accounts for over 50% of the Federal health budget. While roughly one-eighth of the U. S. population is over 60, almost one-half of it is under the age of 25. Unfortunately we have an infant mortality rate which is greater than that of some 14 other countries." The author asks if in our tremendous expenditures in medical research we have really bought health.

It is estimated that, in order to render comprehensive care to all people, the number of physicians must be doubled, the nursing and paramedical population quadrupled, with an increase of over one million hospital beds, all within the next generation.

Certain hospitals have endeavored to meet additional demands upon their facilities by operating upon a seven-day week program, thereby eliminating week-ends without surgical or similar services. Surprisingly this seems to meet with favor by the nursing and paramedical personnel who are able to enjoy four successive days off in place of the traditional week-end. Indeed, the day may not be too far distant when hospitals will be obliged to operate all services around the clock in three shifts, if the efficiency experts in Washington have their way.

It is interesting to consider the probable changes in medical schools of the future as suggested by Paul J. Sanazara, M.D., Director of Education, Association of

American Medical Colleges. This was published in the December issue of Mayo Clinic Proceedings entitled "Emerging Patterns in Medical Education." This envisions the medical school of the future requiring molecular biology along with physics and chemistry as prerequisites to the study of medicine. The medical school itself will function somewhat as a university offering various courses not wholly confined to medicine. Increased emphasis will be placed on Social and Behavioral Sciences. Education in college, medical school, internship, and residency training will be planned and conducted as a continuum. The core curriculum would be supplemented by additional courses depending upon the student's goal. This indicates a much earlier specialization within the medical curriculum. Certification will be done by the medical school. Residencies will not be of fixed duration. As soon as a student has demonstrated his fitness, he will be examined and then certified in his chosen field.

With emphasis upon expansion, the competition among hospitals for nurses threatens the former ethical relations between our institutions. The shortage of all nursing and paramedical personnel seems to have developed recruiting drives just as ruthless as found in industry. This is not helped by some of the educational requirements advocated by governmental agencies, such as requiring a baccalaureate degree for all physiotherapists. This is not only impractical but is ludicrous, when we can train physiotherapy aides in three months who can serve quite well under the guidance of a certified physiotherapist. And this holds true as well for surgical and even for medical social aides. Much of these bureaucratic requirements smack of "plain esoteric nonsense."

It is interesting to note the concern of the Catholic hospitals at this time. Church authorities are faced with three burning questions demanding answers: 1) Can there be; 2) Should there be, and 3) Will there be a Catholic identity in the evolving government-sponsored comprehensive health network? Can the Catholic hospital be an integral part of the secular health network—an instrument of American society—and at the same time be an integral part of the work of the church? Will the governmental plan demand lay and possibly non-Catholic representation on the governing Boards, as implied in the report, "Health Is a Community Affair"?

The Catholic Hospital Association has formed a task force to study the future role of the Catholic Hospital. It is planned to include Catholic representatives who are authorities on constitutional and canon law, administration, medical practice, education and sociology. It emphasizes "the need to forego prestigious aspirations and join in unity for the common good and to further the work of the Church."

These great scientific developments, which have given us the means of curing disease and of overcoming handicaps undreamed of years ago, have resulted in increased specialism with the development of sub-specialties, acutally fragmentation of many formerly conventional fields of practice. This trend is bound to continue and to increase as further developments and research lead to new areas of activity.

Unfortunately this fragmentation may tend towards "gun-barrel vision," if we may use this term, as indicating a neglect of the patient as a whole. We, in otolaryngology, have seen the unfortunate results of unwise tympanic or stapes procedures in the presence of active, but unsuspected infection, or allergic conditions, or even the neglect of other serious bodily states. The specialist, no matter how restricted his field, should think broadly, making use of all indicated consultive services. The increasing trend to group practice may be one answer to this problem.

Dr. Sataloff and I were pleased last year at our Annual Program on Occupational Hearing Loss to hear Dr. E. A.

Irwin, Medical Director of the Ford Motor Company, speaking to a large group made up of plant physicians and many nonmedical personnel, stress the extreme importance of a carefully taken history in the evaluation of hearing loss, rather than putting sole reliance on audiometric tests.

In the past, medicine has been largely oriented to the care of symptomatic disease with organ-oriented specialties, such as the acute case of appendicitis, for example. Only recently have we been devoting any attention to the stage of presymptomatic disease; or to the importance of rehabilitation of conditions which we cannot cure but in which we strive to assist the patient in achieving as good a state of independent living as possible, making optimum use of what he has.

Unfortunately, as a result of some of these newer developments there has been an inevitable increase in depersonalization. It has become evident that the mechanized era, as represented by automation, tends towards a mechanized patient with the inevitable neglect of psycho-social factors, and there is less "tender loving care." All of this has changed the image of the doctor and of the hospital in the eyes of the public. The question has been raised whether the "milk of human kindness" has been curdled by molecular biology.

"New patterns of hospitals already are on the drawing board. Kaiser Industries have plans for what they term the 'Instant Hospital' which can be built in about a year and at a considerable saving in cost. Its basic pattern is a 200-bed automated center with patient rooms radiating outward toward the circumference. The building pattern centralizes medical, nursing and other services to minimize walking to patients' rooms. It puts visitors' corridors along the outer walls to keep them out of the work areas. Kitchens are virtually eliminated. Foods are now brought prepared, generally frozen, and stored in refrigerator carts outside the patients' rooms. When the patient is ready to eat, the food is heated on a radar range in 30 seconds. Efficient, obviously, but hardly gracious or hospitable.

"Two terms one often hears in business are automation and systems integration. Both terms connote varying degrees of operational improvement with advantages leading to reduction in costs, production improvement and better utilization of resources. But systems integration and automation are not panaceas for improving care in hospitals, for we are well aware that every task does not lend itself to automation. There is still a large measure of personal service in patient care." *

Fourteen years ago, at the request of *Modern Hospital,* the Institute for Motivational Research conducted a psychological study of hospital-patient relationship, which proved most revealing. With the use of purely psychological techniques, this was done on a qualitative rather than a statistical basis. A number of hospitals, ranging in size and located in different types of communities, were used in the study.

The method of study included content analysis of hospital literature, magazines and newspaper articles, followed by insight (clue) interviews, observations within the hospitals, depth interviews (nondirect probing such as employed by the psychoanalyst) and projection tests.

This study indicated that, while attractive environment and efficient professional services and facilities mean much to the patient, there is a prime nonmedical factor which rarely is given due consideration and which has a tremendous effect upon his hospital experience and which even influences his speed of recovery. It

* Pearl R. Fisher, M.A., Administrator, Thayer Hospital. The author wishes to express his sincere appreciation for this quotation.

showed that the ideal hospital, to the patient, is one with a warm, friendly, understanding environment, and that buildings and equipment are secondary in importance.

One of the most striking facts brought out in this psychological study was that the adult patient on entering a hospital becomes emotionally a child. There is a prime feeling of fear, of insecurity and of dread of making necessary adjustments to a strange environment. He resents certain procedures which cause physical embarrassment. There is a threat to his individuality, his maturity, and his illness is seen subconsciously as a failure, or sign of aging, or deterioration. It is the attitudes rather than the procedures themselves to which he reacts.

It was found that the type of administration, the atmosphere of the hospital, and the attitudes of the medical and nursing staffs had a marked influence upon patients. Certain institutions were administered most efficiently but in a cold, authoritative manner with endless rules and regulations, which "was like being in a factory" or "like a policeman doing his duty without feeling." This type definitely was productive of conflict and insecurity. The laissez-faire type of hospital, on the other hand, had no conflicts and no rules or organization. While interrelations were friendly, the patients nonetheless had a marked sense of insecurity. In contrast to these was the disciplined but permissive type where there was basic security evoked by rules which had rational validity. The patient here realized that the routine was carried out with concern and consideration as in a "loving family."

This presents a challenge both to hospitals and the medical profession. Hospital personnel should be thoroughly indoctrinated in the personal approach to patients, both by example and by training. A warm sympathetic atmosphere is good therapy for the sick patient. This can be engendered, not only by the medical and nursing staffs, but also to good effect by laboratory, dietary, and maintenance personnel. After all, patients are people. Will this be possible in the hospital of the future?

"Whither we goest" indeed becomes terrifying. Government, first through Medicare, Title XIX, and now Public Law 89-749, has committed itself to a total health care program from "the cradle to the grave."

This indeed is laudable, if it be possible to avoid substituting quantity for quality, and to preserve the personal attitudes that contribute so much to convalescence and recovery. Computors, auto-analyzers and multiphasic screening all lend much to efficiency but with an inevitable loss of individuality and must be used with an understanding of their limitations, else we have completely computorized patients to care for.

Mosher once said, "The operating hand is cold and the microscope has a glassy eye." If he were alive today, he could add, "The computor has neither human understanding nor sympathy." After all, the end point of medical science is good patient care. This requires a large measure of warmth, time, human understanding, and patience—ingredients no computor can provide.

Medicare, Title XIX, and Public Law 89-749 and 89-239 have become laws of the land and are here to stay. We must accept this and endeavor to assist in their development, making use of all possible facilities. This may take seven years, or even longer, but seems the only way to assure people in all areas and in all economic situations of the adequate and skilled medical and hospital care that they have been promised. This requires expansion and drastic changes in programs for education and training of physicians and nurses, as well as paramedical person-

nel, and sound area-wide planning for hospital and health facilities. This may well be the last remaining bulwark against complete governmental control of our hospitals and medical profession.

Have we the leadership, the gentle humanistic understanding and the art of compromise, when necessary, inherent in Dr. Coates' philosophy, to make this come true?

Gleanings from *Medical Inquiries and Observations* of Benjamin Rush[1]

By WILLIAM S. MIDDLETON[2]

THE roll of the signers of the Declaration of Independence has a hallowed place in American history and appropriately so, for it includes many of the most illustrious names of that period. Among them, none is more conspicuous than Benjamin Rush. Born in Byberry, Pennsylvania, he had all of the cultural and educational advantages of a prosperous family of that period (1745–1813). He attended the Nottingham Academy and progressed remarkably under the tutelage of the headmaster, his uncle, Reverend Samuel Finley. In the College of New Jersey, young Rush manifested the emerging qualities of independent thought and leadership that were to characterize his entire professional career. Upon graduation (Bachelor of Arts, 1760), he was apprenticed to Dr. John Redman of Philadelphia. The life of the house-pupil of that day was arduous and Redman was a hard taskmaster. Yet, in later years, Rush testified in warm terms to the kindness and the inspiration of his master. His medical education was furthered by attendance on the lectures in anatomy by Dr. William Shippen, Jr., in 1762. With the foundation of the Medical Department of the College of Philadelphia (1765), Rush enrolled in the course in materia medica under Dr. John Morgan. However, he pursued the pattern of the favored few Americans of that era by completing the medical curriculum at the University of Edinburgh (1766–8). Among his teachers in that remarkable institution, William Cullen made the most profound impression on young Rush. By apparent prearrangement, the recent graduate was made Professor of Chemistry in the new Medical School on his return to Philadelphia (August 1, 1769).

Thus launched into a professional career in his native community, Benjamin Rush was to attain a position in clinical medicine unexcelled in the history of this country. Yet even in his day, he was a controversial figure. An aggressive, dynamic crusader, he waged unpopular campaigns against slavery, alcoholism, and the atrocious care of the mentally ill. In a period when theorists reigned supreme in medicine, he lent his talents and prestige to the thesis of the unity of disease. This circumstance, coupled with his advocacy of prodigious blood-letting and purging in febrile states, has led to an unfortunate eclipse of Rush's true position in American medicine. His *Inquiries and Observations* afford an intimate insight into his medical philosophy and practice that should modify this reaction.

Consistently, Rush introduced the discussion of all disorders with observations of the attendant meteorological factors. With a particular local flavor, he commented on the "unwholesome exhalations" from the Neck, a swampy area between the mouth of the Schuylkill River and the Delaware. To the noxious air rather than mosquitoes, the physicians of that day attributed the fevers. An illuminating note appeared under the inquiry regarding bilious and intermitting fevers. In recommending the avoidance of night air, Rush advised, "Even the morning air before the sun rises, should not be

[1] Presented at the William Snow Miller Medical History Seminar, University of Wisconsin, Madison, Wisconsin, 11 October 1967.

[2] 2114 Adams Street, Madison, Wisconsin 53711.

breathed, until the body has been fortified with a little solid aliment or a draught of bitters."

One of the most remarkable of Rush's observations relative to sanitation was written thus: "The dung of domestic animals, during its progress toward manure, may be excepted from this direction. Nature, which made man and these animals necessary to each other's subsistence, had kindly prevented any inconvenience from their living together. On the contrary, to repay the husbandman for affording a shelter to these useful and helpless animals, nature has done more. She has endowed their dung with the power of discharging the effects of marsh exhalations, and of preventing fevers." Rush further remarked the health of certain Europeans who stabled their stock under their own roofs.

In a philosophical vein, Rush wrote, "Nature does mischief. She wastes herself with unnecessary fever, in dropsy and consumption. She throws a plethora upon the brains and brings in apoplexy and peripneumonia notha. She ends a pleurisy and peripneumonia in a vomica, or empyema. She creates an unnatural appetite for food in the hypochondriac disorders. And lastly, she drives the melancholy patient to solitude, where, by brooding over the subject of his insanity, he increases his disease."

In a more expansive mood, he said that "in a word, the combined discoveries of natural history and philosophy, united into a system of materia medica, all show, that although physicians are in speculation the servants, yet in practice they are the masters of nature. The whole of their remedies seem contrived on purpose to arouse, assist, restrain and control her operations." In his consideration of the relation of food and taste to each other and to health, Rush urged the happy analogy, "The relations which every color and sound bear to each other, was as immutably established at the creation, as the order of the heavenly bodies, or as the relation of the objects of chemistry to each other." He cited the harmony of "bread and meat, meat and salt, alkalescent meat and acescent vegetables." Speaking of sounds and tastes, he added, "They both have their flats and sharps. They are both improved by the contrast of discords."

Rush treated the aging process with dignity and decision. Favoring longevity were ancestry, temperance in eating and drinking, mental activity ("moderate exercise of understanding"), equanimity of temper, and matrimony. The zest for the new life gave emigrants a better prospect for long life. Sedentary employment need not shorten life. Loss of teeth, gray hair and baldness do not portend short years. "The duration of life does not appear to depend so much upon the strength of the body, or upon the quantity of its excitability, as upon an exact accommodation of stimuli to each of them. A watch spring will last as long as an anchor, provided the forces which are capable of destroying both are always in exact ratio to their strength." With reference to equanimity, Rush wrote, "The violent and irregular action of the passions tends to wear away the springs of life." As all physicians will agree, Rush remarked, "It is a fact, that the desire of life is a very powerful stimulus in prolonging it, especially when that desire is supported by hope.... Despair of recovery is the beginning of death in all diseases." Painstakingly he outlined with fine clinical insight the physical and the psychological phenomena and diseases of the aging process. Hopefully he stated that lifelong students "suffer decay of their memories, but never of their understanding."

"Death from old age is the effect of a gradual palsy. It shows itself first in the eyes and ears in the decay of sight and hearing—it appears next in the urinary

bladder, in the limbs and trunk of the body, then in the sphincters of the bladder and rectum, and finally in the nerves and brains, destroying in the last, the exercise of all the faculties of the mind.

"Few persons appear to die of old age. Some one of the diseases which has been mentioned generally cuts the last thread of life."

In another relation, wise advice was thus offered, "The quickest way and most effective way of conquering a fever, in most cases, is by an early submission to it." Interestingly, he admonished, "Do not condemn, or oppose unnecessarily, the simple prescriptions of your patients. Yield to them in matters of little consequence, but maintain an inflexible authority over them in matters that are essential to life." Rush had a singularly chauvinistic turn that was expressed in the following passage:

"Who knows but it may be reserved for America to furnish the world from her productions, with cures for some of those diseases which now elude the power of medicine? Who knows but that, at the foot of the Allegany mountain there blooms a flower that is an infallible cure for the epilepsy? Perhaps on the Monongahela, or the Potowmac, there may grow a root that shall supply by its tonic flowers, the invigorating effects of the savage or military life in the cure of consumption." Significantly, he recommended exercise for the consumptive patient. Following the precept of Sydenham, he advised horseback riding in an advanced stage of graduated physical effort. Indeed, the steps were so graded as to meet modern standards. In the management of dropsy, Rush again advised exercise accommodated individually to the status of the patient: *"hurtful* by being given in too large doses in the beginning; and *useless* by being given in too small doses, in the subsequent stages of the disorder."

After ten years study, William Withering published his epochal treatise on foxglove in 1785. His meticulous care in clinical observations assured its acceptance and sustained success. Yet Benjamin Rush took vigorous exception to its effectiveness, as witnesses the following: Foxglove is "supposed to exert a specific action on the kidneys as a diuretic; but I am rather disposed to believe, that it acts only by lessening the action of the arterial system by a sedative quality which appears to reside in it." Then he continued, "In dropsies of too much action, I believe it has sometimes been used with success, but in atonic dropsies, I am satisfied that it is not only an useless but a dangerous medicine. I am sorry to add further, that after many trials of this medicine, I have failed in most of the cases in which I have given it." In another relation, Rush proceeded, "Where medicines have once been in use, and afterwards fall into disrepute, as was the case with the Foxglove, I suspect the cases in which they were useful, to have been either few or doubtful, and that the cases in which they had done harm, were so much more numerous and unequivocal, as to banish them from the materia medica." Rush's critical judgment was dated 1789, only four years after the publication of Withering's classical monograph.

Rush's strong position against spirituous beverages was expressed on every occasion. *An Inquiry into the effects of spirituous liquors upon the Human Body and their Influence upon the Happiness of Society* embodied his medical and sociologic tenets of opposition. Briefly stated, the listing of medical effects included sickness in the stomach, loss of appetite for breakfast, morning vomiting, tremor, pallor, universal dropsy, obstruction of the liver, jaundice, diabetes, pains in limbs, burning sensation in palms and soles, hoarseness, cough, epilepsy, palsy, apoplexy and madness. He proceeded with his charge: "War has its intervals of destruction—but

spirits operate at all times and seasons upon human life." Warming to the attack, Rush stated, "They harden and contract the fibers of the stomach and bowels, or induce in them abscesses and gangrene—they produce schirri in the viscera—they induce ossification in the tendons, arteries, and pleura, and lastly—they produce a peculiar crispness of the hair, insomuch that the wig-makers in London give much less for it, than for the hair of sober people. . . . They fill our church-yards with premature graves, they deface the image of God in the soul. They damage or destroy the intellectual powers, they fill the sheriff's docket with executions, they crowd our hospitals with patients, and our jails with criminals, they lead to places of public ignominy and punishment and lastly, they people the regions —but it belongs to another profession to shew their terrible consequences in the future world."

Rush advised against the use of alcohol as a vehicle for medication; yet he recommended wine in the convalescence from a number of illnesses. Indeed, he suggested its use as a substitute for spirits in faintness, exhausted and debilitated states and after unusual exposures, in these terms:

"It has been remarked, that few men ever become habitual drunkards on wine. It derives its relish principally from company, and is seldom, like spirituous liquors drank in a chimney corner, or in a closet. The effects of wine upon the *temper* are likewise in most cases directly opposite, as those that were mentioned of spirituous liquors. It must be a bad heart, indeed, that is not rendered more cheerful and more generous, by a few glasses of wine."

In the treatment of alcoholism, Rush struck a modern note. "No man was ever *gradually* reformed from drinking spirits. He must not only avoid tasting, but even smelling them, until long habits of abstinence have subdued his affection for them. To prevent his feeling any inconvenience from the sudden loss of their stimulus upon his stomach, he should drink plentifully of camomile or of any other bitter tea, or a few glasses of sound old wine every day."

As a measure of Rush's intellectual integrity, he wrote, "Dissections daily convince us of our ignorance of the seats of diseases, and cause us to blush at our prescriptions. What certain or equal remedies have we found for the gout, the apoplexy, palsy, dropsy of the brain, cancer and consumption? How often are we disappointed in our expectation from the most certain and powerful of our remedies, by the negligence or obstinacy of our patients! What mischief have we done under the belief of false facts (if I may be allowed the expression) and false theories! We have assisted in multiplying diseases—We have done more—we have increased their mortality."

And again, he wrote: "Give me leave to recommend to you, to open all the dead bodies you can, without doing violence to the feelings of your patients, or the prejudices of the common people. Preserve a register of the weather, and of its influence upon the vegetable productions of the year. Above all, record the epidemics of every season; their times of appearing and disappearing, and the conditions of weather with each of them. Such records, if published, will be useful to foreigners and a treasure to posterity. Preserve, likewise, an account of chronic cases. Record the name, age and occupation of your patient; describe his disease accurately, and the changes produced by your remedies; mention the doses of every medicine you administer to him. It is impossible to tell how much improvement and facility in practice you will find from following these directions."

The professional credo of so complex a character as Benjamin Rush would occupy a volume. If we revert to his

Medical Inquiries and Observations, certain quotations will afford some measure of the man as a physician. "A physician . . . should consider his obligation to his profession and society as undischarged, who has not attempted to lessen the number of incurable diseases." Several further approaches were made to the same matter. For example, "But let us not despair, it becomes a physician to believe that there is no disease necessarily incurable; and there exist in the womb of time, certain remedies for all those disorders which elude the present limits of the healing art."

Very sound advice was offered to young physicians on matters of personal dress and the approach to patients.

"Avoid singularities of every kind in your manner, dress and general conduct. . . . Singularity in anything, is a substitute for such great or useful qualities as command respect; and hence we find it chiefly in little minds. The profane and indelicate combination of extravagant ideas, improperly called wit, and the formal and pompous manner, whether accompanied by a wig, a cane, or a ring, should all be avoided, as incompatible with the simplicity of science and the real dignity of physic. There is more than one way of playing the quack. It is not necessary, for this purpose, that a man should advertise his skill, or his cures, or that he should mount a phaeton and display his dexterity in operating to an ignorant and gaping multitude. A physician acts the same part in a different way, who assumes the character of a madman or a brute in his manners, or who conceals his fallibility by an affected gravity and taciturnity in his intercourse with his patients. Both characters, like the quack, impose upon the public. It is true, they deceive different ranks of people; but, we must remember that there are two kinds of vulgar, viz., the rich and the poor; and that the rich vulgar are often below the poor, in ignorance and credulity."

Particularly were his further admonitions relative to bedside manner sound and reflective of his deep consideration for the patient: "Let me advise you, in your visits to the sick, *never* to appear in a hurry, nor to talk of indifferent matters before you have made the necessary inquiries into the symptoms of your patient's disease. . . .

"Preserve, upon all occasions, a composed or cheerful countenance in the room of your patients, and inspire as much hope of recovery as you can, consistent with truth, especially in acute diseases.

"Pride has no natural fellowship with the profession of medicine," Rush declared. Hence, while he rejected the "futile pretentions" of Mesmer, he accepted certain of his tenets in these terms: "But I am willing to derive the same advantage from his deceptions, which the chemists have derived from the delusions of the alchemist. The facts which he had established, clearly proved the influence of the imagination, and will, upon diseases. Let us avail ourselves of the handle which those powers of the mind present to us, in the strife between life and death." In the area of mental illness, Rush wrote, "It is the duty of physicians to assert their prerogative and to rescue the mental science from the usurpations of schoolmen and divines. It can only be perfected by the aid and discoveries of medicine."

Returning to the bedside, Rush offered the further advice: "Make it a rule never to be angry at anything a sick man says or does to you. Sickness often adds to the natural irritability of the temper. We are, therefore, to hear the reproaches of your patients with meekness and silence. It is folly to resent an injury from a sick man: since, from his weakness and dependence upon us, he is unable to contend with us,

upon equal terms. You will find it difficult to attach your patients to you by the obligations of friendship or gratitude. You will sometimes have the mortifications of being deserted by those patients who owe most to your skill and humanity.... I would rather advise you to give the benevolent feelings of your hearts full scope, and to forget the unkind returns they will often meet with, by giving to human nature—a tear."

Recognizing the treachery of prognosis, Rush extended his admonition to an area of professional quicksand that entraps so many clinicians. "Avoid giving a patient over in an acute disease. It is impossible to tell in such cases where life ends, and where death begins." He decried the practice of indiscriminately announcing a desperate outlook. "I know that the practice of predicting danger and death upon every occasion, is sometimes made use of by physicians, in order to enhance the credit of their prescriptions if their patient recovers, and to secure a retreat from blame if they should die. But this mode of acting is mean and illiberal. It is not necessary that we should decide with confidence at any time, upon the issue of a disease."

In the matter of professional fees, Rush obviously straddled the issue in some degree. "Avoid measuring your services to your patient by scruples, and ounces. It is an illiberal mode of charging. On the contrary, let the number and *time* of your visits, the nature of your patient's disease, and his rank in his family or society determine the figures in your accounts. It is certainly just to charge more for curing an apoplexy, than an intermittent fever." He admitted, "Medicine has its Pharisees, as well as religion."

The image of Benjamin Rush becomes much clearer with recent studies of his life and times. His *Medical Inquiries and Observations* afford an unusual opportunity for the analysis of the man and his philosophy of medicine. Measured in terms of his time and opportunities, his achievements were remarkable. To criticize his errors of therapy in the light of modern knowledge is as unfair as was the immoderate adulation that elevated him to the rank of Sydenham in an earlier day. A public-minded citizen, he played an important role as a Signer of the Declaration of Independence. A humanitarian, he vigorously championed the rational care of the emotionally ill. A fearless advocate of freedom and temperance, he resolutely fought slavery and ardent liquors. The most popular teacher-physician of his period in this country, Benjamin Rush, for better or worse, more profoundly affected medical practice than any other individual in America. In spite of some unmistakable evidences of rigidity on his part, his adaptation to other situations would support the belief that, given a different intellectual climate, he would have shed the tangled web of pragmatism that so seriously limited his vision and would have emerged a more rounded figure. Nonetheless Rush remains for posterity the most distinguished American physician of his period, whose basic contributions weighed heavily in his favor in the balance of human welfare.

Memoir of John S. Fetter
1911–1967*

By JEROME M. WALDRON, M.D.

DR. John S. Fetter was born in Pittman, Pennsylvania, on March 26, 1911, and died August 26, 1967. Into these few years, he packed a full life which was full of life. Unfortunately, most of us knew him only during his medical life. This began in 1932 after his graduation from Bucknell University when he entered Jefferson Medical College. Among his friends and acquaintances he was truly known as a gentleman and scholar.

His scholarly pursuits are chronicled in the membership records of numerous societies including The College of Physicians. He was a member of the American Medical Association and its affiliated societies together with all radiological societies in the United States. As a member of A. O. A., he was graduated from Jefferson Medical College in 1936. The next few years were spent at Philadelphia General Hospital as an intern and resident in radiology, leading to certification by the American Board of Radiology in 1941. He was an instructor in radiology at the Graduate School of Medicine of the University of Pennsylvania from 1940 to 1953.

Although Dr. Fetter had been on the staffs of Wills Eye Hospital and Philadelphia State Hospital, his professional life was intimately concerned with Nazareth Hospital. He started the Department of Radiology as a one man department and nurtured it into a department with modern facilities and five full time members.

He instituted a residency program which has led to two of "his boys" becoming chairmen of their own departments. As proud as he was of "his boys," he was equally proud of his Technician Training School. Much to his credit, not one of "his girls" failed to pass her boards. During this time, he wrote many papers concerning treatment of radiation sickness, as well as papers on kidney, gastrointestinal and hematological subjects. His last paper was on the diagnosis of placenta previa. The wide range of his papers exemplifies the breadth of his scholarly interests.

He was truly a scholar and gentleman. The latter, unfortunately, is never chronicled anywhere except in many peoples' hearts. Etiquette, refinement and good dress were the nature of John Fetter, but his genuine interest in people was the full extension of his genteel manner. Only tradition makes one list his training of residents and technicians under scholarly attainment. His interest and concern for his boys and girls made training a "Scholarly Finishing School." Concern did not end with graduation. They were his life. His wife, Hazel Greenly, whom he married April 6, 1946, complemented and supplemented his concern for others. We thank his wife and three daughters for sharing his life with us.

What a life to be a part of! He enjoyed every minute of it. He imparted this enjoyment to anyone who had the privilege to be in his company. Life does not owe Dr. John Fetter anything. John Fetter does not owe the world anything. We are indebted to him for having known him.

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Drug Abuse: Legal and Ethical Implications of the Non-Medicinal Use of Hallucinogenic and Narcotic Drugs

The Mary Scott Newbold Symposium*

Chairman

FRANCIS C. WOOD, M.D., *President, The College of Physicians of Philadelphia*

Moderator

J. RUSSELL ELKINTON, M.D., *Editor, Annals of Internal Medicine*

Participants

DANA L. FARNSWORTH, M.D., *Henry K. Oliver Professor of Hygiene, Director, University Health Services, Harvard University*

HENRY BRILL, M.D., *Vice-Chairman, New York State Narcotic Addiction Control Commission*

JONAS ROBITSCHER, J.D., M.D., *Attending Psychiatrist, The Institute of the Pennsylvania Hospital; Lecturer in Law, Villanova University School of Law*

(*Dr. Wood*) Welcome to the Mary Scott Newbold Symposium.

This lectureship was established in 1917 by Mr. Thomas B. Newbold for the edification of the people of Philadelphia.

Ludwig Einthoven, the originator of the electrocardiograph, was one of the early lecturers. The list includes A. N. Richards, Eugene Opie, George Corner, Sir Wilfred Grenfell, Sir Thomas Lewis, Walter B. Cannon, Harold Goldblatt, Lord Adrian, and Dickinson Richards. We are proud to have had them, and we are proud today to have you with us.

I will now turn this meeting over to the chairman, Dr. J. Russell Elkinton, who has been a physician and teacher of medicine all

* Mary Scott Newbold Lecture LXXXVIII, The College of Physicians of Philadelphia, 2 March 1968, presented as a symposium.

his life and is now the Editor of the Annals of Internal Medicine.

(*Dr. Elkinton*) Thank you, Dr. Wood, and welcome to the members of the audience.

The College of Physicians of Philadelphia is holding a symposium on this subject as a service to our community. The nonmedicinal use of narcotic drugs has long been a problem, that of hallucinogenic drugs has been growing at an alarming rate. As physicians, we are concerned about the physical, mental, social, and moral effects of these addictions, especially in our young people; this concern is shared by teachers, by those who administer schools and colleges, by those who make and administer the law, and not the least by parents.

The three participants in this panel are all physicians trained in psychiatry, but they come to this discussion with different backgrounds. Dr. Dana Farnsworth is Director of Health Services at Harvard University and Master of John Winthrop House; in these capacities he certainly oversees a significant segment of the younger generation. In addition, he is chairman of the American Medical Association Council on Mental Health. Thus, he brings to us several very important kinds of experience. Dr. Henry Brill is vice-chairman of the New York State Narcotic Addiction Control Commission, which puts him right in the middle of the largest narcotic addiction problem in this country. He is also chairman of the A.M.A. Committee on Alcohol and Drug Dependence. So he, too, brings to us a wide experience in this field. Dr. Jonas Robitscher is not only a practicing psychiatrist in our metropolitan area, but a lawyer as well. Hence, he brings to us expert knowledge in these two fields that are so closely allied attempting to meet this problem. I might also say that he is author of a recently published book, entitled *Pursuit of Agreement: Psychiatry and the Law*. The moderator is a teacher and investigator in the field of internal medicine and is a medical editor.

The frame of reference for the subject matter of this symposium is broad. In the first place, what *is* the problem? What are the medical, legal and social aspects—especially the new aspects—of addiction to narcotics that we need to consider? The use appears to be growing of marijuana (cannabis), of psychedelic drugs such as lysergic acid diethylamide (LSD) and of the amphetamines taken intravenously. This expanding use is to be found primarily among young people in high school and college and from middle class and wealthy families. What is the effect on the user, on his family, on his school, on society?

Secondly, is this problem part of a larger problem of an almost unique alienation of the younger generation from ourselves who are middle-aged or older? If so, what are the causes? Do the causes include the permissiveness of family and school in the earlier part of their lives, the affluence of their social class, the loss of religious beliefs and the relaxation of moral standards, the severe over-crowding of an expanding population, and the involvement of our country in a seemingly futile war that is diverting the nation's human and material resources away from building a better society at home? Are these the factors that lead our youth to take their kind of "trip?"

And thirdly, what can we and what should we do about it all—as parents, as physicians, as teachers, as administrators of the law, as citizens? It is unlikely that this symposium will supply definitive answers. But we do hope that the problems will be defined and that the general shape of some of the answers will take form. We invite you, the audience and the community, to share with us this task.

This panel, with Dr. Wood and Dr. French, the chairman of the Newbold Committee, had breakfast together and I assure you that it was a very enjoyable and interesting occasion. I sat among a group of expert raconteurs, and at the end we almost wished we had taped the conversation because our exploration of how we wished to conduct this discussion was illustrated by many delightful

stories. At the end we agreed that each of us would not use any of the other's stories or epigrams, and so at this point I am going to restrain myself from telling a story and will turn this symposium over to the panel.

One word about our procedure. We propose to have each of the three panelists, in the order of Dr. Farnsworth, Dr. Brill and Dr. Robitscher, give first a presentation to you of their own views of the problem. After a short intermission we will proceed to an exchange of opinion and, I suspect, even some disagreement among the members of the panel. Then we hope to have an exchange with you as members of the audience.

The Appeal of Drug Abuse

(*Dr. Farnsworth*) Thank you, Dr. Elkinton. I will violate one of the rules about the stories right in the beginning for a very good reason. Several years ago, in a meeting in which Dr. Wood and I participated, he defined an expert (the three or four of us up here): an expert is a person who explains a simple thing to you in a confused way, but in such a manner as to make you feel that the confusion is all your own fault. So, in that sense, you'll have to judge us.

One good principle of pedagogy is to tell your audience what you're going to say, then tell them, and then tell them what you've said. I'm going to follow that up very slightly here to say that, with this particular problem, it is necessary to have hard facts in order to influence young people. Opinions are valuable, but they are not valuable if presented as facts. Young people are not easily frightened, respond negatively to horror techniques, resent exaggeration, and are well informed even though many of the things they know are not true.

There is developing a large group of quasi-pharmacologists in this country. Youngsters in the eighth and ninth grade can ask questions about drugs that most physicians cannot answer, and some do not even know the significance of the questions asked. Our opposition, to polarize the question, has many tactics to obfuscate the whole subject. One is that "marijuana is no more harmful than alcohol." "Drug dependence is no worse than being dependent upon music, or one's spouse, etc." "You cannot discuss drugs unless you have used them." "If alcohol and cigarettes are legal, then all drugs should be." "The whole problem is the unfair laws. If we didn't have laws about them, we wouldn't have any problem."

If we approach the solution of the drug problem with single-minded determination to eliminate drugs or prevent their use by young people, we run the risk of adding to our difficulties rather than minimizing them. Drugs should be viewed as an incidental factor, considered in the same manner as acting-out behavior, disrespect for property, acting on impulse, or delinquency, and *not* as the central problem. People are our problem, not drugs. But this does not lessen the importance of appropriate laws for the control of potentially harmful drugs.

The misuse and abuse of drugs is of long standing, involving not only the opium derivatives but also cannabis and many others. For the most part these drugs have been used by those who suffered from pain, unhappiness, low self-esteem, or some other unpleasant situation from which they sought relief. The recent interest in the drug problem has centered in large measure on a quite different motive of the drug user, the desire for a new experience, the development of a greater insight into the nature of his own behavior, a means of expressing disapproval of values upheld by society, or a form of expressing rebellion against parental authority and the social system. Instead of using the older drugs, newer compounds, particularly the hallucinogenic drugs and the amphetamines, are the most favored.

Drug use, in this newer sense, involves some of the most fundamental and compelling issues connected with human existence (for example, varieties in degree of freedom, creativity, societal organization and aims), and, indeed, it is currently receiving serious

consideration. What its abundant literature makes clear is that drug use is almost invariably a highly-charged subject which attracts, not surprisingly, few non-partisan observers. In addition, a large number of opinions and attitudes in this area are not based on fact, empirical evidence, etc., and cannot be at this point because too little is known about such drug use.

There are several reasons for this lack of information. One is that drug use is not a monolithic phenomenon. There is no "typical user" either in terms of economic status, individual psychodynamics, motivation, or frequency of use. Moreover, individual responses to these hallucinogenic drugs vary greatly and vary even in one person from time to time. Perhaps the greatest obstacle to studying drug use is the fact that it is so laden with "meanings," some appropriate and some not, that the issue becomes a vehicle or an occasion for intellectual and emotional acting-out. This does not mean that we should not take the matter seriously, or even get excited about it, but we have to know what the difficulties and what the complexities are in order to develop relevant and effective approaches.

When confirmed users talk about drug experience they frequently employ a noticeable tone of self-righteousness. This may result partly from their feeling that they are being victimized and from their being consistently put on the defensive by police, school officials and parents, etc. But it also stems from their belief in having found "the right way." Rather than believing in everyone's right "to do his own thing," drug enthusiasts tend to proselytize and to dismiss out-of-hand those who disagree or are not interested.

This denigration of other styles is similar to certain kinds of religious intolerance, and the tendency to refer to "revelation" and "the feeling at one with the universe" reinforces the parallel. I am not implying that any claim of a drug episode as being a kind of religious experience is necessarily invalid. Obviously, some people find it valuable in exactly that way. (A friend, who is not a patient, said after taking LSD he understood the true relationship between man and God. Well, that's quite a discovery.) But the accompanying denigration of other styles, the assumption that non-users are hopelessly "out of it," can only confuse the issues, cause antagonism, and call into question the gains claimed from the experience.

Of course, drug use itself is not new; it is widespread in some cultures and is an integral part of certain religions. However, we live in a society with no significant history of drug use in this sense. Until recently, a composite picture of a drug user would have indicated that he was poor, uneducated, living in one of the few urban slums, more than likely involved in criminal activity of some kind, and addicted (probably to heroin). A social outcast, he constituted a problem for law-enforcement officers, a very few social workers and rehabilitation personnel, himself, and his family. This group is still present incidentally. The great majority of us, while vaguely aware of this group of drug users and perhaps sympathetic, didn't see it as a problem affecting us directly. But now we are suddenly confronted with a noticeable and increasing incidence of it, particularly among the young, the relatively affluent, and the comparatively well-educated. It is the well-fed, the well-dressed, otherwise the law-abiding students and young adults of America's middle class—people we know.

Perhaps this is the heart of it. Perhaps it seems clear from what the new drug users say, that drug use is a package deal which has to do with values; that is, it represents a repudiation of certain aspects of the American way and an attempt to work out a more meaningful and satisfying style of life. This involves many elements and it would be simple-minded to label such activity either as "youthful rebellion," a pure quest for Truth and Beauty, immoral renaissance, or "cop-out." It certainly is easier to put everything in

a pigeonhole of our own devising, but useless. Many different people use drugs for many different reasons.

The first step, for those who are opposed to the use of drugs for non-medicinal purposes, is to admit that drugs have a strong appeal for some people. The second is to try to understand what it is. Drug use makes certain promises, some of which are delivered as advertised, some of which are fraudulent, some of which come true in a different way. The fundamental promise is that things will be changed, and a significant number of young people are for that. (I think that there is a closely-related hope of eliminating pain, but not of the physical kind, which is analogous to the original medicinal purposes of these substances.) The pain of boredom is probably the greatest of all the deterrents to the "hippies," for it is terribly boring to act so bland, and to act so kind, when one is so depressed, so hostile, and so agitated.

What these people seem to be aiming for is a style which values heightening of aesthetic response, subjectivity, introspection, insight, self-knowledge, sensitivity, non-verbal and non-rational experience, pleasure and creativity. They put a priority on new ways of seeing, which are primarily based on sensory and emotional activity, and they are interested in present gratification rather than in long-term gains. What they are reacting against is a system in which the basic principles are work for its own sake, achievement, production, competition, exploitation, absolutism, and postponement of gratifications. There is a mixture of things to which they object, some to which we would also object, most to which we would subscribe. Obviously, not all drug takers are utopians or even sincere idealists; some are. In general, we all seem to be interested in taking the pressure off.

Estimating the risk of taking drugs is for the great majority of persons an abstract process. Solid evidence being so sparse (that is, from the proponent's point of view, not ours), when the risks catch up with the user, the previous possibilities of escaping the consequences become meaningless to him. Risk of chromosomal damage, or permanent psychosis, do not seem like risks to the person who maintains that there is no clear-cut evidence that such results do occur. Clinical and laboratory experience suggests extreme caution in the use of hallucinogenic drugs. But, an interesting aspect of this is the question of how many people would continue to take drugs even if they knew that a certain percentage of them would suffer permanent damage.

For example, many studies indicate that, while marijuana by itself does not cause adverse reactions, it may trigger psychotic reactions in people with unstable personalities or existing emotional difficulties. However, there is no way of identifying such people before the decompensation takes place. Other studies indicate that there are two main groups of users: the pleasure seekers and the self-improvers, and that many of the latter are not motivated by a desire to deal with their own emotional difficulties. This means that a self-selected group of the very people who are most likely to be vulnerable to drugs are most likely to take them. It would be useful to know whether drug use reflects willingness to take a true risk or unconscious belief in personal invulnerability. Do users really accept the possibility of insanity (to use a legal term) and/or having children with congenital anomalies? Do they accept the chance of danger, but think they can beat the system? Do they believe that there is actually no danger? Obviously, there are many attitudes and it would be helpful to have more information.

Proponents of drug use often imply that anyone who is not willing to try them is somehow "wanting." "If you like your life as it is, don't take drugs." This implies that anyone who wants to maintain his own status quo is an insensitive, unadventurous "clod"—a challenge hard to ignore. However, suppose one likes some aspects of his life and dislikes

some parts that he would like to change. This "pie in the sky" or "chicken if you don't" attitude is simplistic. What if life is somewhat more complex and demands something other than all-or-none solutions? Or, suppose a person believes that not liking life as it is necessitates action which will change existing conditions. At this point one becomes involved with what one can only call moral questions. That is, the premise of regular drug use is that the current "system" is evil and damaging and that the appropriate response is to remove oneself completely—to operate in other terms entirely. This is parallel with our more radical student protestors' beliefs: we must destroy the present social system; we must destroy the universities as they now exist. Then they feel that somehow or other what will grow up out of the ashes will be better. To many people that answer is itself evil because it means that one is in no way involved in or responsible for others' pain and suffering, and this lack of concern and action is immoral. But there isn't any objective answer, simply two conflicting moral positions. Drug users could argue that a belief in the moral obligation to work to alleviate others' pain results from being brought up in a society characterized by the Protestant Ethic and that, instead of keeping a finger in the dike, one should let the flood occur. In other words, these people are very idealistic; they feel that they are very moral and really are trying to do what they think are the right things, but at the same time they are really trying to be quite immoral in other areas and are totally parasitic on society, and their attempts to act on their impulses and to repeal the laws of sanitation have not been particularly successful.

Regular drug use decreases an individual's drive: longstanding or conventional ambitions and goals no longer seem important or even meaningful. (To a lesser extent, even occasional use has a similar or temporary effect.) Again, chronic users would argue that this shift in values represents a triumph over traditional and damaging attitudes, a new freedom to live on one's own terms rather than those dictated by society for its own benefit. A good example was portrayed on a PBL TV program recently. A girl was so angry because she felt people were forced to conform to what other people dictated, i.e., to wear certain clothes and the like, and she said, "I don't have any shoes on tonight because people say I have to wear shoes." She missed the point: she didn't have her shoes on and nobody was saying anything about it. But, she believed what she was saying with great intensity. Their opponents would argue that such changes merely indicate a loss of judgment and a withdrawal from significant human activity. There is no doubt that many drug users are sincerely interested in achieving greater creativity, by which they mean greater subjective awareness and contact with their own emotional and intellectual processes; and there is some truth to the fact that contemporary society does not place much value on contemplation, inwardness, and subjective experience. Creativity, however, is generally regarded as including productivity. If drug users see this attitude as being a "hang up," most practicing artists do not. While the latter often do not consider the end products of the creative process as more important than the process, they see the process itself as one which in fact produces works of art. The main thing, as I've tried to point out in many different contexts, that happens to persons who become firm drug users is that from then on nothing happens. The great philosophical theories are developed, but they are not recorded; the great paintings are envisioned, but nothing happens; everything draws to a halt. At the same time the individual feels that something wonderful is happening.

So, there is no doubt that regular drug use turns people from their former concerns and patterns of action; moreover, it often seems to fix them in a continual concern with drug use itself, i.e., drugs become the form and content of their lives. Even occasional marijuana smokers seem to talk about "pot" a great

deal. The drug scene seems to have a large paranoid component, probably because drugs are illegal. There have been enough cases of entrapment and informing for drug users to have a realistic basis for nervousness, but even with friends in relative privacy many "pot" smokers, for example, interpret outside sounds as the police.

One of the factors preventing a true dialogue about drugs is that drug use has become a sign and symbol of the generation gap, so that discussion tends to focus on generational conflicts and to embody those conflicts with partisans lining up fairly predictably and accusing each other of upholding a position for reasons that have little to do with the facts. Of course, if there were more facts available, and there were less room for subjective interpretation, the situation would be much easier. If any known dosage of all existing drugs causes irreversible psychosis, relevant debate would be much easier, although far less necessary.

As the dangers from LSD have become more apparent, particularly those involving chromosomal changes with the risk of birth deformities, college students have become much more cautious and have apparently used it less and less frequently. Even at the height of its usage several years ago, the percentage of our students who had used LSD at least once was approximately 5. Marijuana users at that same time were estimated to include about 15 per cent. Judging from recent surveys, the percentage has risen to 30 and 35 per cent, with possibly a fourth of that number using it quite regularly. But, there is one peculiar thing about the marijuana users: those who use it think that almost everyone else is using it, and those who do not use it think that practically no one else is using it. Whatever we claim, there are plenty of people who can, with very good reason, dispute it. But, judging from my study of the drug scene, and listening to all the signals for the past seven years, I think those figures are not too inaccurate.

The use of marijuana, as I have said, is probably becoming more widespread, often with the rationalization that it is no worse than alcohol, and if alcohol is legal, then marijuana should be also. (As Sidney Cohen said, "Simply because we have a lot of rumheads is no reason we have to have a lot of pot-heads.")

The argument that the harmfulness of one harmful agent is no logical reason for the introduction of still others whose harmful qualities are as yet not fully determined is usually immediately rejected.

The use of marijuana can be viewed as a spectrum, at one end of which there are those persons who have no serious emotional problems but who try it out of curiosity. Finding that it adds nothing to their efficiency or long-term satisfaction, they discontinue its use and are not permanently hurt by the experience. They have withdrawn while they were able to exercise free choice. I would estimate that this group includes 50 per cent of the users.

In the middle are those who are persuaded by their associates to use it, get a temporary pleasurable feeling of belonging to the group, but then find that their preoccupation with the drug interferes with their effectiveness in their work or studies. With some effort, and with psychiatric and other professional help when it is available, they succeed in getting rid of their dependence on the drug. Though free choice is impeded for a while, they can, with some assistance, free themselves from dependence. I think this is another 40 per cent.

At the other extreme, about 10 per cent, are a considerable number of persons with serious emotional problems who find that they can avoid thinking about them when under the influence of marijuana. Thus, they can postpone solving their problems constructively. In this group, stronger drugs are often suggested by associates, and LSD (and similar hallucinogenic substances) or heroin are tried. Free choice is no longer available.

It simply is not true that some of the people who use marijuana do not go on to other drugs.

They do, but not necessarily because they use marijuana. Those who stop using marijuana early suffer no demonstrable harm. Those who continue to use it, and become dependent upon it, all too often lose their ability to use their intellectual capacities constructively and become lost to society, or, as I have said elsewhere, "Once a person goes so far that he needs drugs constantly, it is difficult for him to change directions. Such people usually drift into mental hospitals or are absorbed into society's version of isolation wards—the defeating, impersonal, homogenized sections of large cities (1)." (Haight-Asbury, East Village, Harvard Square.)

Indiscriminate use of hallucinogenic drugs by those of whom little is expected is tragic for the individuals concerned but not of overwhelming significance to society. However, when they are used by persons charged with great responsibility to others—physicians, medical students, government officials, lawyers and judges, members of the clergy, or those responsible for the operation of complex machinery—the dangers become obvious. Hence, use by graduate students must be viewed with the utmost gravity. For medical students especially, the unsupervised experimental use of these drugs is incompatible with their goals of becoming physicians. It is important that every medical student should know this and important that his dean make this clear to him. A national program of education regarding these drugs, based on solid evidence, is urgently needed. Fear tactics do not work. Exaggerated statements have a negative effect. Numerous programs of drug education are now being formulated (this is one of them), and it is to be hoped that the best features can be combined into an effective program that will be widely carried out in all high schools and colleges.

(*Dr. Elkinton*) I think the applause, Dr. Farnsworth, shows that you've given a very lucid account of this large problem to which we're addressing ourselves this morning. I must say that apparently Harvard Square has changed since I was a student there. Let us now turn to Dr. Henry Brill and ask him to carry this discussion onward.

Marijuana in Dialectic and in Clinical Practice

(*Dr. Brill*) I am going to follow Dr. Farnsworth's advice, with some modifications: I shall tell you what I am going to try to say, say it, and then tell you what I think I said. First will be a description of some practical and mostly personal experiences with marijuana use as it relates to other drug dependence in the New York area during the past 35 years. Then will come a brief comment on the experiences of certain foreign countries with cannabis, a term which includes the products of marijuana as well as the crude plant itself. Next will be a description of the dialectics which have been developed to defend and justify the use of drugs and particularly the use of marijuana as a "fun thing." Finally, I shall try to show how this line of logic runs contrary to practical experience in this country and abroad. In closing, I shall hazard a guess as to the future course of the current controversy about marijuana.

Just before I left the office last night, a phone call was referred to me as the psychiatrist member of the Commission. On the other end of the line was a young man in great agitation and anxiety. He and his girl friend had smoked some marijuana the night before. It was his second experience and her initial one. After the first cigarette she suddenly went into a panic, couldn't be controlled and was now in a hospital. Two questions were uppermost in the man's mind. First, what was his legal responsibility? Second, what was the outlook for the girl? Would she have to go away for treatment and if so where? I tried to calm his fears as well as I could and to reassure him as to the probable outcome of such a "bad trip." He hung up, still guarding his anonymity; meanwhile, I was protecting my mental reservation that not all such cases are equally benign or uncomplicated.

This is by no means an isolated case. I

have seen a number of them, as have many psychiatrists in the New York area. Whether there is a relation between simple exposure to marijuana and the onset of a pathological intoxication is always open to debate in any specific case, and young persons who are not so directly involved as was the young man in my story will vigorously maintain that the marijuana was contaminated with stramonium or a hallucinogen. Others will maintain that such reactions are a coincidence or that at most the disorder was already pending and merely triggered by the drug.

Such reasoning is likely to give small comfort to the patient or his family. It is even less acceptable when the reaction persists and one faces the task of placing the victim in a private psychiatric hospital. Then one discovers if he does not already know it, that these facilities have recently been admitting a large number of young persons of this type. They have accepted as many as they can absorb and are reluctant to accept more. The clinical picture is well known and now common-place. The patient is usually male, often confused, and somewhat disturbed. He has been taking not one drug but many; marijuana is probably the most likely initiator of his drug-taking career. Such cases often have a history of acute transitory reactions in the past—"bad trips"—but by the time they come to a private psychiatric facility they may require months of care and treatment. Being prone to conduct disorder in a group, they are difficult to handle in large numbers, and, hence, there are problems in placement.

The state hospitals serving large metropolitan areas also have seen such cases increasingly during the past few years. This has been our experience at Pilgrim State Hospital, which serves a district in the suburbs as well as one in metropolitan New York. The cases we see are young persons who have drifted in and out of high schools and/or colleges. They have worked in a casual irregular fashion for a time, have fallen into a kind of vagabondage and finally were hospitalized as a result of an acute undifferentiated paranoid hallucinatory psychosis with anxiety and disturbed behavior. They give a history of associating with others of the same age and similar drug habits and a semi-vagrant life in the suburbs or more recently in what has come to be known as the hippie culture of the large city.

The current pattern of multiple drug dependence is radically different from the heroin habit which is now old. Indeed the only factors which they have in common is the similarity of the basic personality defect of the victim and the use of marijuana. This is the drug which plays the primary role most frequently in the rites of initiation to the new multiple drug culture as it has for heroin over some decades.

My own experience with marijuana began with a period from 1937 to about 1950 at the Pilgrim State Hospital where I saw large numbers of psychiatric cases from Harlem. A frequent incidental detail of their histories was that the patients had smoked marijuana. Having read some of the fascinating classical French literary accounts of the spectacular effects of cannabis, I naturally looked for similar wonderful dreams, visions and sense distortions in my marijuana smokers, but to no avail. The answers were dull, disappointing and uniform: "Nothing special, a little bit like alcohol. It makes me feel better." Only later did I recall that Baudelaire had said in his essay on "Wine and Hashish," "I do not say that hashish produces in all men all the effects which I have just described . . . there are temperaments where the drug creates only a rowdy foolishness . . . violent gaiety . . . bursts of laughter . . . a completely materialistic hashish reaction." He clearly stated that education and imagination are required for the more elaborate experiences. My cases were poorly-educated or illiterate; there was no expectation of great experiences, and, finally, I myself was not sufficiently certain to be able to elicit what was there. Conversely, neither of us was sensitive to the fact that the drug might be

involved in acute psychiatric reactions. I never asked about this, and was never told. I finally wrote off the old cannabis stories as fabrications of the French literary mind, which was a mistake.

Following World War II, I came to see marijuana in a different light. Heroin addiction in the U.S. had increased sharply and by the early 1950's had become a source of serious concern. This was especially true in New York City, which has the unfortunate distinction that it is the home of half of the 62,000 U.S. heroin addicts. I was drawn into this work in the mid-1950's and found that some 60% or more of the addicts had used marijuana before heroin. The patients themselves had no complete theory as to the relation between the use of the two drugs but felt that in some way marijuana did have a relationship to heroin. The story of the transition was quite uniform. At that time and for years before, both drugs had been used almost exclusively in the ghetto. There, groups of adolescent boys first learned to smoke "reefers" in much the same way as they learned to smoke tobacco, by association, emulation and group process. The drug passed from the older to younger boys through the initiative of the younger ones. Pushers played no role. The two drugs moved through somewhat the same or similar channels of trade however. The next step would be taken a year or two later when someone brought heroin into the group.

Not all would become "hooked," but those for whom heroin had an attraction would move over to it in a group. The process was and is regularly described as a group reaction with a selective screening based on a mutual affinity between drug and victim. It has been argued that such a sequence is purely coincidental and no closer than the association between the use of milk and addiction to heroin. Statistical studies however indicate that the addict explanation is closer to the truth and that in specific ghetto areas about 20% of marijuana users later become heroin addicts. It is, furthermore, rather significant that when one discusses the question with non-addict members of the Harlem community or similar drug-ridden areas they are agreed that marijuana contributes to the heroin problem even though they have no explanation as to the mechanism involved.

This opinion is in sharp contrast to that of many college people who vigorously maintain that because of their experience one must consider marijuana harmless. Their opinion is subject to discount on two grounds. The first is that the college experience with this drug has been relatively brief; a few years are not enough time in which to judge a drug under field conditions. The second is that the conditions of the college experience are very specific and preclude any firm judgment about the effect of the drug under other conditions. In college experience, for example, marijuana has not been associated with heroin use. In the ghetto it has. On the other hand, I know of no acute psychiatric complications among ghetto users, but these are occurring under college conditions.

Finally, in evaluating general experience with cannabis, we must pay attention to those areas of the world which have known this drug for the longest period, the countries of the Middle East and North Africa. Here the prevailing opinion is that chronic marijuana or hashish excess can produce vagabondage and mental disorders although it does so in only that fraction of the exposed population which finds a mutual affinity with the drug and turns to it as a way of life. In January 1968, I had the opportunity to see some cases of chronic cannabism with Professor Miras in Athens. He states that in an area centering on the Piraeus there are some 400 to 600 cases of chronic cannabism and an estimated 4000 users. Cannabism produces a clinical picture somewhat like that of alcoholism but clearly distinguishable. I examined the cases of Miras, noted the syllabic speech, loose-jointed gait, and the superficial attitude of apathy from which they were easily roused to a curious good-humored detachment. I noted the lack of certain stigmata of alcoholism

(reflexes and skin changes) and was convinced that this is a clinical syndrome. There does appear to be such a thing as cannabism, and vagabondage is associated with it. On other grounds, one may also accept the fact that there is such a thing as acute and chronic psychiatric disorder associated with this drug.

To my mind, it would be mistaken to write off the centuries-old clinical observations in these countries just as it was a mistake on my part to write off the marvelous hashish experiences described in the older French literature, even if it is called "decadent" by some critics. Nor can we write off the experience of our own ghettos. The findings appear to be different in each setting and one cannot judge the potentialities of the drug from experience in one setting alone. To duplicate a finding, one must duplicate all of the essential elements under which it was noted.

The new trends in college and suburban drug use as they involve marijuana are strikingly different from those observed in heroin-using neighborhoods. The sociological and clinical pictures are radically different. Yet the two stories have one element in common; case histories leave no doubt that marijuana has long been important in the rites of initiation to heroin use, and now it has come to play the same role for a medley of other drugs.

One may ask what if anything is really new about all this. Is it merely an old problem that seems new because of the attention it has been getting? Dr. Farnsworth has already pointed out that drugs have long been used for pleasure and in a social context, often on a large scale. This is not new. What I think is new is the current vigorous rationalization and justification of such practices and the elaborate dialectics that have been developed in defense of drugs. This, as far as I can determine, never existed before. In previous times such use of drugs was always looked upon as undesirable, a manifestation of human weakness, and a matter of concern because of the associated hazards. Today drug use of this kind has become a part of a protest movement in youth, it has been intellectualized and has recruited an enthusiastic band of debaters to support this position. By no means all of them are drug users; in fact, the most effective ones appear to be the ones with the least personal experience. Heavy users tend to be disinterested and not intellectually driven to argumentation, or anything else for that matter. I have the impression that those who are most vocal are more interested in the debate than in the drug.

The arguments presented are highly academic and abstracted from reality. They tend to be aimed at justification of a single item, usually marijuana, even though the practical problem today is that of multiple drugs. Most of these drugs are still legal and some of the most dangerous have only recently come under any control, yet no debate is complete without the assertion that if LSD or marijuana were legal it would no longer be attractive for abuse. Original items in the scientific literature are regularly quoted, as, for instance, The Mayor's Committee Report of 1944, but few have done more than cull arguments from codifications of pro-drug dialectics that are now available on book stands everywhere. Finally, the experience which gives conviction to many of the most sincere of the pro-drug group amounts to no more than the fact that they know some persons who have been taking "pot" with no apparent damage. Such experience is a collection of the most serious errors of drug evaluation, namely, observer bias, introspective self-evaluation, lack of follow-up, inadequacy of sample size and of duration of observation, dependence on negative findings and rationalizing away of positive ones, and a complete lack of experience with the evaluation of psychotropic drugs. These testimonials are mixed with an evangelistic identification between the freedom to use drugs on the one hand and on the other questions of Civil Rights and liberties, although I have yet to hear that the Civil Rights movement itself supports the free use of drugs. A few more

examples of the nature of the logic employed may be of interest.

A favorite argument is that the laws governing marijuana and other drugs are bad laws. This rouses emotions and can be relied upon to mobilize a natural antipathy to law and its enforcement, yet it has no relevance to the basic issue as to whether there are hazards in marijuana and other drugs of dependence.

The absence of physical dependence is presented as a powerful argument against control. It ignores the fact that drugs of dependence produce their damage largely through mechanisms other than that of physical dependence. Cocaine, for example, is universally acknowledged to be the most dangerous of these drugs, yet it does not produce physical dependence. Dependence, physical or mental, is not the issue. The real issue is the potential for producing harmful behavioral effects, including mental effects. The social disability associated with the hallucinogens is less spectacular than is that of heroin, but it is still serious for a significant number of persons. One of the earliest and most frequent is a loss of ability to apply oneself to intellectual tasks; nothing seems important enough to warrant an effort.

Among students and others who normally face the severest demands on their capacity to perform exacting intellectual tasks, and who require the greatest emotional stability and control, these relatively minor signs of drug disability can be most serious. It may seem strange that it is the college students who insist most vehemently on the harmlessness of the drug, but one must remember that the drug is a hazard only to some, not to all, and those who do falter in college disappear quietly from the scholastic scene. When they reappear as patients or as clients of a rehabilitation service they are no longer known to the academic world. The family and the professions surround them with secrecy, and this side of the drug picture is easily hidden from other students. Thus, the dialectic of the pro-drug group still remains insulated from reality and as much of a problem as the tar baby was for Brer Rabbit and for much the same reasons. Arguments and logic merely lead to entangling counter-arguments and counter-logic, and, if it were not for clinical experience with actual cases, it would be easy to be half convinced by the arguments which appeal to every liberal and anti-authoritarian impulse. But every case with adverse reactions which one sees renews the profound conviction that in this direction lies evil for too many people.

This thought leads to the final argument of the drug supporters: even if drugs do harm the individual, no one has the right to protect him against his will. He has the right to do what he wishes with his own body. All this would be true (within limits) if there were no harm to others. The fact is that the drug harms the individual in such a way as to be harmful to others, and in many ways. Outstanding are the social and economic burden on the family of the victim and this burden is far more serious and direct than the burden of ordinary illness. In addition, there is a hazard to the social contacts of the drug case because this is a contagious condition, although the contagion is mental rather than physical. For these and other reasons, drug dependence is not the private business of the individual who becomes involved in this class of drugs. He does not allow it to remain only his private business. His behavior makes his drug dependence the business of others.

In summary, then, I would say that the discussions about drugs as they are heard in colleges and academic groups tend to be abstracted from the real problem, which is multiple drug abuse, and not use of any one drug. The reasoning is clever but not convincing because it is based on poor observations and poorer literature. The arguments trace back to such classics as *The Varieties of Religious Experience* by William James and include much from Aldous Huxley's *Doors of Perception*, but it was Timothy Leary who more than any other provided a systematized dialectic which glorifies the use

of dependence-producing drugs and created a sort of platform for the pro-drug campaign. Since then a very large literature has been created in this pattern, and it is from this and not from solid scientific sources that the young people draw their inspiration. All of these arguments run counter to medical experience here and abroad and counter to the experience of those populations which have been most heavily exposed to cannabis.

One often wonders how this controversy will be resolved. There are various possibilities, but one may be sure that solved it will be. Perhaps it will follow the sequence of the LSD controversy which was settled by a sort of broad common consent. Certainly it did not occur through dialectical skill on the part of one or the other side and still less by convincing those committed to a point of view. The chromosome findings have of course had a strong impact but I believe that there were other factors too. Experience with the psychiatric complications was coming to be known and had its effect, and perhaps even more important was the growing realization that for all of the salesmanship the drug was not so great after all.

Perhaps the marijuana controversy will fade out in a similar way as experience accumulates. Inequities of the law must be settled, of course, but this will not settle the basic questions about this "fun drug." It may seem strange indeed to invoke the need for more experience with respect to a drug as old as marijuana, but this drug is really new to the population which is now so enthusiastic about discussing it. The entire experience in the schools goes back only a few years. For schools it poses special problems, and it seems inevitable that in this closely-monitored population who must respond to exacting demands for mental productivity any short term hazards can not long remain hidden. The decision is of course one of public policy and will be reached by a consensus of the decision-making apparatus of society. In this perspective, the importance of continuing discussion is of course obvious, yet it would appear to be a mistake to rely on discussion or on time alone. In view of the vitality of the debate, it is apparent that we also need the best possible observation and reporting of adverse reactions to this drug in order that an informed judgment may be made. Of all the additional information which seems to be needed in this field, data on acute reactions seem the most crucial at the moment, and the flow of this purely clinical information into the scientific literature needs to be accelerated. In short, we badly need an effective central register of adverse reactions to marijuana. I would offer this as the central conclusion of my paper.

(*Dr. Elkinton*) I'm particularly interested in the optimism that you expressed at the end of your talk, and I suspect that there are a lot of people in this room who are only too happy to think that the marijuana fad will sink from the weight of its own results. But, of course, in the interim before we reach that happy day we still have the problems of the young people who haven't yet reached that enlightened point of view. This, of course, is posing not only medical and psychiatric problems but also is posing problems to the people who make the laws and to the people who enforce our laws. For this reason, it is very appropriate at this point in the program to turn to our third speaker, Dr. Robitscher, who speaks in both capacities, that is, as a psychiatrist and as a lawyer.

Legal Questions in Drug Abuse

(*Dr. Robitscher*) Dr. Elkinton, fellow panelists, and friends. One of the disadvantages of being third on the panel is that many of one's good points have already been anticipated. I think this has a disadvantage, because I'll be repeating some ideas that have been presented before, but perhaps in repeating them it will re-inforce what was said, and perhaps some of these ideas may come through in better fashion as a result.

One of the facts of life today is the way that matters which once seemed very simple have come to seem complex to the point

where we just can't come to decisions when we have to make them. In previous periods of American history, there was much more general agreement on right and wrong, good and bad, but now we seem to have trouble coming to agreement on these questions.

This morning in our discussion of non-medicinal use of drugs, I think we come here in general agreement on a number of things. I don't think any of us would disagree that chromosomal damage is bad. I don't think that any of us would think that pushing heroin is good. But, after we have completed discussing all the things that we can agree on, I think there will still be a number of subjects about which we will not agree, although the panel is in substantial agreement.

I thought it might be helpful for my part of the program to deal with only two very specific problems. The question of what legal control should be exerted over the use of marijuana is one question that is causing a great deal of difficulty. The other question I wanted to deal with is the right of society to force compulsory treatment on people who are addicted, a question which relates more to "hard core" addicts than to marijuana users. To what extent should this be a medical matter and to what extent a police matter?

If our panel had taken place a few years ago, as Dr. Brill and Dr. Farnsworth have noted, we would be discussing LSD and there would be a great deal of discussion about whether LSD provides an experience which is really religious or spiritual or mystical.

If we were discussing LSD, I think we would be on easier grounds than we are when we discuss marijuana. As has been pointed out, LSD trips seem to be more vivid and give a greater hallucinatory experience. On the other hand, the risks are greater and the issues seem more truly joined. So, a few years ago we had Timothy Leary on one hand and Commissioner of Narcotics Harry Giordano on the other, who were prepared to fight the battle of LSD to the death. But, in the meantime, news has come out about chromosomal damage, and there have been several sensational murder cases and a number of suicides committed under the influence of LSD. Although LSD continues to be a problem of concern for drug control officials and although scientific experimenters would still like to work and will work with therapeutic effects of LSD, there is no organized public today that is fighting for unrestricted distribution of LSD as the way to a brave new future.

All the energy which went into the battle for the increased use of LSD has shifted to marijuana. But, there's one major difference. LSD is an entirely new psycho-pharmacological preparation. It is a synthetic preparation; it had not been covered by existing legislation. And so the laws which have been passed regarding its control had to be relatively moderate.

Most of the new laws correctly differentiate LSD from narcotics which are addicting, and they provide for penalties which are less severe: for example, a one year sentence for a first offense, and a two year maximum sentence for a second offense. These are far less severe than the provisions of the Marijuana Tax Act of 1937, which considered marijuana pretty much in the same category as a narcotic and provided for a sentence of up to five years, even for a first offense.

This inequity in penalty has become a tremendous issue for many members of the alienated younger generation, who feel that the prohibition of marijuana and its inequitable penalties rank with the U.S. policy in Vietnam, the prohibition on abortion and the refusal of college physicians to prescribe the "pill" as the major social issues of our times.

In spite of the fact that marijuana and other cannabis preparations have been used since at least the 8th Century, there is very little evidence that those regions associated with its use down through the centuries—

India, Egypt, Turkey, North Africa—have become more spiritual or more capable of pursuing truth than other regions.

Although we can't ascribe too much meaning to this, legend tells us that Hasan Sabbah in the Caspian Sea area around the year 1100 promoted the use of cannabis to increase the fighting potentiality of his Islam warriors. The word "assassin" in Arabic, meaning "under the influence of hashish," and both the words "assassin" and "hashish" are said to be derived from the name of the founder of the sect, Hasan Sabbah. So much for legend.

Skipping over the next 750 years, we come to the Paris of a century ago, where Gautier, Dumas, Baudelaire, Rimbaud and others describe their use of hashish, which they began to experiment with as part of their literary interests in the culture of North Africa. In the United States, FitzHugh Ludlow in 1857 published an account of his hashish experiences. Ludlow gives us some ideas which would be of interest to Fisher, Dement and others currently working on the function of dreams. He says, " . . . Although previous to acquiring the habit, I never slept without some dream more or less vivid, during the whole progress of the hashecsh life, my rest was absolutely dreamless. . . . The vision of the drug entirely supplanted those of nature."

Ludlow also called attention to the relationship between taking hashish and a tremendous desire to eat and great thirst, highlighting what is of great interest to psychiatrists, the relationship of drug use to basic oral needs and oral deprivation.

An interesting sidelight is that the first American to describe his experiences with marijuana (in contrast to hashish, both cannabis preparations) was Horatio C. Wood, Jr., son of the Horatio C. Wood who was Professor of Pharmacology and also of Psychiatry at the University of Pennsylvania. In this building, there is a room dedicated to the Wood family, four generations of which have been involved in medicine, often in psychiatry, and in Philadelphia medical life.

Horatio Wood, Jr., in 1869, in the proceedings of the American Philosophical Society, published his account describing ingesting an alcoholic preparation of Kentucky hemp; he tried this on himself and some friends. He noted very much the same types of experiences that present day users note. He felt it might have some therapeutic applications. He noted that one of his friends, besides experiencing great thirst and great hunger, complained (I guess the word is complained) of excessive sexual interest which lasted for several days. I think it continues to be a continuing debate, whether marijuana actually does heighten, whether it deadens or whether it has no effect on sexual interest.

Walter Bromberg in 1939, writing in the J.A.M.A., gave a pronouncement on marijuana which practically everyone writing on the subject since has adopted. His general conclusion was that marijuana is not addicting; it has been considered non-addicting by most American authorities. In contrast, however, European and Asian writers, who have had more experience with the subject, consider it habit-forming although not addicting.

In spite of the widespread use of marijuana for more than 30 years, we've had remarkably few sound scientific studies. The most widely stated study is the famous report of The Mayor's Committee on Marijuana, commissioned by Fiorello LaGuardia in New York in 1938 and issued in 1944, which is a quarter century ago. The report gave marijuana a clean bill of health, and it has been cited very often since, but its scientific design is open to serious question. The study goes into extreme detail concerning the effect of marijuana use on a number of functions and tests, including strength of grip, hand and foot reaction time, results on thematic apperception tests, and literally scores of other observations. But, the information we are most concerned with, the

possibility of mental and physical deterioration, is treated in the most cursory way. This was partly because most of those in the study who were classified as users and even those considered chronic users had used marijuana for a period of two years or less. So the study does not really give us information about long-term use.

Studies from India and South Africa, on the other hand, dealing with long-term marijuana use, indicate a great concern over its habit-forming potentialities.

The marijuana controversy, therefore, continues unresolved. There is general agreement that marijuana is a milder hallucinogen than LSD, that it is not addicting and that it does not cause marked physiological deterioration. There is little agreement on anything else.

Some of the problems that we have in social control are caused by groups such as the American Medical Association and the American Psychiatric Association which insist on rushing in with statements based on very little evidence that can cause untold grief and complications in later years. One classic example, I think, is the 1956 A.M.A. resolution concerning alcohol, which stated with authority that the syndrome of alcoholism was a disease or illness. This pronouncement has had great impact on courts, which now have attempted to decide to what extent public drunkenness is a disease, not a crime, and thus not subject to police and court control. Similarly, I think the recent A.M.A. statement on marijuana is unfortunate. Among its points, which are based on very little data, is that no physical dependence or tolerance from marijuana has been demonstrated. Neither has it been shown as yet that marijuana has caused any lasting mental or physical changes. Then comes this statement regarding use by young people: "It is in the nature of adolescence to seek new and exciting experiences, to question self, family and society, to try on and discard new guises of behavior, to reconcile opposing pulls and strains, to act like child and adult. Such experiences contribute to personal growth and ultimately to intellectual development and social progress, though in some instances the behavior may appear to some viewers as thoughtless, irresponsible, or rebellious."

So it should console us to realize that, if our children are using "pot," their experiences will ultimately contribute to intellectual development and social progress. Many years ago, Adelaide Johnson wrote a psychiatric article in which she expressed the theory that when children act out antisocially, they may be putting into practice the wishes and desires which their parents entertain but are too inhibited to act upon. Phrasing the same idea in another form, we can say that the way our children turn out may largely represent the sum of our conscious and unconscious ambitions for them.

Never before in American life have so many adults encouraged so many children to behave so destructively. Only a rare voice is raised for conservatism, like Keller, who spoke on adverse reactions to marijuana at the last meeting of the American Psychiatric Association, who said that we do not have good data on any phase of marijuana use but that we have a number of other voices ready to rush to express permissive opinions.

One of the main reasons we should be careful about encouraging the use of marijuana is that it appears to promote social withdrawal and lethargy, as experiences in Egypt and India show, and these changes may be irreversible. We do not know too much about the physiology of these changes, but they do appear in the world literature of cannabis usage.

Bloomquist, writing in California Medicine (which means that he ought to know), says that the chronic user develops inertia, lethargy and indifference. He indulges in self-neglect. Even though he may give the excuse that he uses the drug to enlarge his understanding of himself, it is the drug experience that becomes the principal interest. Rosenbaum, a psychiatrist and psychoanalyst practicing in Santa Fe (and he also should have first hand experience with

the problem), says that drugs do not enhance self-awareness but rather create an auto-erotic state in which the drug taker regresses to that infantile state in which the child experiences his sensations and body parts as if they were the entire, wonderful, joyous universe.

Before we can deal with the marijuana problem, we have first of all to come to terms with our own attitude about the problem, to become convinced, if there is sufficient evidence to convince us, that its detriments do or do not outweigh potential gains. The old argument that marijuana should be avoided because it is against the law and if you break the law you can destroy your future does not carry a great deal of weight with today's youth. They see this argument as hypocritical.

Harry Giordano and Food and Drugs Commissioner Frank Goddard during the last few days have tried to express a conciliatory point of view in testimony on proposed laws to control LSD—that the proposed Federal penalties should be aimed at pushers and traffickers rather than at youthful users whom they describe as "experimenters." While sympathizing with their aim, which is to prevent the stigmatization of youthful offenders, it is hard for me to imagine successful control of LSD, or of marijuana either, if only the middleman is penalized and the ultimate user is seen as essentially guiltless. If effective LSD or marijuana control is to be achieved, the buyers and users, no matter how young or how bright, will have to be made to assume some responsibility for what takes place.

But, it is increasingly hard for our permissive society to insist on observance of laws. When the President last week in his narcotics message to Congress proposed a new and more effective Bureau of Narcotics and Dangerous Drugs to coordinate functions now carried on by two separate bureaus, although most physicians supported him, there were several who rushed into print to describe this, as one doctor described it, as "a political ploy—it is a very popular thing to attack evil."

I think in the long run that the most effective arguments for or against the use of marijuana will come from longitudinal case studies. I think that we will just have to follow the life histories of users and see what happens to them, and find out whether it's true, as they claim, that marijuana can be used without penalty or whether there is a real penalty in the form of loss of drive, ability, physical well-being. We will have to find out whether marijuana really leads to the better life.

I think we should note that most varieties of hallucinogens—from glue to opium—do cause physiological damage. It is reasonable to expect that the mechanism of the altered perceptions that cannabis produces will very possibly turn out to be physically harmful. But, only time will tell.

Now let me shift to a quite different area: the question of how society should deal with the serious addict or the chronic alcoholic, who, unlike most marijuana users, can't maintain himself in society and who thus becomes a problem for our over-worked police. We are faced with an overwhelmingly difficult dilemna here. If we treat the addict as an ill person, we will be forced to devote a large share of our limited fund of psychiatric manpower to deal with largely untreatable patients. We are often forced to admit a patient to an institution for therapeutic purposes, even though we're not convinced the treatment will be useful and even though the patient would rather not be treated.

For the purposes of this discussion, we can include alcoholism with other serious addictions, since the rationale which courts first developed in regard to hard-core addicts has since been applied to alcoholics and since pending legal cases deal with both classes of addiction. This involves us firmly with one of the chief problems in modern legal medicine: the movement to take whole categories of what have up to now been considered crimes, remove them from the jurisdiction of the

warden and the penologist, redefine them as illnesses, and in so-doing make them non-crimes and thus the responsibility of physicians in general and psychiatrists in particular.

The background for this is that the Eighth Amendment to the Constitution provides against the infliction of cruel and unusual punishment. In 1962, in *Robinson* vs. *California*, the Supreme Court pushed this doctrine into an entirely new area, where it had never been applied before. The Court said that, if a person is jailed even for one day for a status or condition over which he has no control, that constitutes a cruel and unusual punishment. Plaintiff Robinson had been arrested under a peculiar California law which made it illegal to be addicted to (not to possess or to use, but merely to be addicted to) narcotics. He was not found with narcotics on his person, and the evidence against him was merely that a police officer noted discolorations and hypodermic marks on his arms. The Supreme Court, I think, could have reversed this conviction on a number of valid grounds, including the vagueness of the statute. But, instead, the Court wrote a new law, extending the Eighth Amendment protection against cruel punishment to the status or condition of drug addiction.

The Court made an analogy, with which not all psychiatrists agree, between the status of addiction and such other conditions as mental disease, leprosy and venereal disease and made the ringing statement that "even one day in prison would be a cruel and unusual punishment for the 'crime' of having a common cold."

Like many court decisions, *Robinson* vs. *California* raises more questions than it answers. Some commentators have suggested that the case requires that we draw a line between voluntary addicts, who are responsible for their use of narcotics, and involuntary addicts, who are not responsible.

Other questions raised are: If a drug addict steals in order to buy drugs, is his stealing a function of his disease and thus not punishable? What about crimes in which the doer presumably does not have the ability to stop his criminal activities, for example, homosexuality, vagrancy, habitual prostitution, indecent exposure?

The Supreme Court has, as yet, not answered these questions, but in 1966 two Federal Courts, the Fourth Circuit Court of Appeals sitting at Atlanta, Georgia, and the U.S. Court of Appeals for the District of Columbia Circuit, accepted the obvious implications of the decision and applied it to chronic alcoholism. They extended it to cover not merely the status of being a chronic alcoholic, comparable to the status of Robinson as an addict, but also to the activity of a chronic alcoholic's being publicly drunk. Both of these cases, known as the Driver and Easter cases, placed much reliance on the 1956 resolution of the A.M.A. to which I referred to earlier, "The syndrome of alcoholism is an illness, which justifiably should have the attention of physicians."

Probably the main purpose of this resolution in 1956 was to persuade physicians in hospitals to treat alcoholics by psychiatric and medical means rather than by preaching or not at all. But, under the Driver and Easter decisions, a drunk in the gutter has been transferred from the responsibility of the policeman to the responsibility of the physician.

This major social change came about, not as a result of public debate and legislative consideration as might seem appropriate, but because a few judges and a few physicians decided the change was beneficial and proceeded to change the law judicially instead of legislatively.

During the 19th Century, there was much controversy as to whether judges could change law. Most judges felt that they were bound by precedent and that only legislators could change law. As you all know, the pendulum has swung very far on this point of view, and the doctrine is firmly established that common law matters not covered by statute can be changed either by action of

legislature or by judicial decision. So, in the celebrated Durham case, in the absence of a statute in the District of Columbia defining that degree of insanity which makes a man not responsible for his criminal acts, Judge Bazelon moved on his own, without legislative cooperation, to redefine criminal responsibility. The Robinson, Driver, and Easter cases similarly circumvent the legislative process, but they do it not in accordance with judicial power to make law but in accordance with judicial power to declare laws invalid if they are not consonant with Constitutional guarantees. Whether the courts act to write new law or to strike down statutory law, they often act on the basis of a one-sided presentation; in a so-called test case, the law enforcement agency is seeking with the help of the court to change the law. The defendants are equally desirous of the change, and no one in the legal proceeding presents an opposing point of view.

Recently, the Philadelphia District Attorney's office decided to adopt the position of the Driver and Easter cases, that public intoxication by an alcohol addict is no more than a symptom of the underlying addictive disease and so not punishable. The District Attorney's office, after discussion with the Defender Association of Philadelphia and the Greater Philadelphia Movement, had test cases brought against two chronic alcoholics and secured considerable evidence from doctors who favored change in the law. Now, because the District Attorney's office had decided beforehand that a change in the law was desirable, the medical evidence which they gathered on the subject was all evidence favoring the idea that chronic alcoholism is not a crime but a disease.

Judge Weinrott accordingly handed down his decision, which the District Attorney's office described as learned and comprehensive but which others would describe differently, declaring that in this jurisdiction chronic alcoholism is a disease, and thus the two alcoholics were discharged from the court's custody. Plans are now underway for a 120-bed center for the treatment of Philadelphia drug addicts and alcoholics, although New York's experience indicates that we are dealing with tens of thousands in these categories and that providing facilities will cost considerably more than the $250,000 now allocated. How the medical manpower will be secured to staff the facilities the District Attorney's office has not said.

A lower court in another jurisdiction has extended the doctrine to cover the crime of vagrancy, and it is hard to know where this movement will end. On the other hand, a California intermediate court dealing with the question of public intoxication has recently come to a contrary conclusion, and this discrepancy will have to be decided by the Supreme Court.

The Supreme Court is scheduled to act, probably this month, in the case of Leroy Powell, a 66-year-old Austin, Texas shoeshine man who has been arrested at least once a year for drunkeness since 1949. During his last trial, a physician testified that he was a chronic alcoholic, and therefore ill. In spite of this testimoney, he was convicted.

His appeal to the Supreme Court is being aided by nine organizations, including such powerful groups as the A.M.A., the American Civil Liberties Union and the Methodist Board of Christian Social Concerns. A spokesman for the American Psychiatric Association has said, "We feel certain they'll rule that alcoholism is an illness for which a person can't be imprisoned." If so, I think we're in for a good deal of trouble.

The police, of course, will be pleased, because 40% of arrests yearly are for alcoholism. If they can merely drop all the alcoholics and addicts off at the nearest hospital, their work load will be lightened. To the same extent, our work load will be increased.

One of the facts that the Supreme Court may not have at its disposal, when it considers the Powell case, is that medical men in general and psychiatrists in particular are not optimistic about cures. A small percentage

of alcoholics and addicts are motivated to seek help and can usually be treated in an out-patient setting. Some far-gone alcoholics and addicts are being treated in hospital settings against their will, often with quite dubious results. But most alcoholics and addicts maintain themselves outside the hospital, get in and out of trouble regularly and do not want our help. This is the kind of patient we don't do very well with, and if this patient becomes our responsibility, then we have to decide what to do with him.

In St. Louis, the program that has been started emphasizes short-term detoxification plus social work help. The alcoholics are brought in and treated with thorazine, detoxified, and then turned loose again, and there is no attempt to get at underlying psychological causes. First reports from St. Louis are quite glowing, but I think our experience tells us that many of these cures may not be maintained for considerable periods of time.

I don't think there is any quick cure that we can offer alcoholics and addicts, and, if there is no quick cure, then are we entitled to hold them for long periods for lengthy cure, or are we entitled to hold them indefinitely, until they reform or change? Will this type of medical treatment be less desirable to the average alcoholic or addict than our present hit-or-miss approach? In the Driver and Easter cases, it was said (and the Supreme Court has also said) that an alcoholic can be held indefinitely. There is no time limit—if the confinement is civil in nature. If you're holding the patient for therapeutic reasons, you can hold him until he dies.

One source of information on this subject, is the Scandinavian experience with enforced therapeutic sequestration for alcoholics, which dates back to 1895. Professor Nils Christie of the University of Oslo says, "Medicine became a justification for the kind of sentence the law itself could not justify. In practice, most skid row alcoholics serve in a very severe prison" (which I might add is not called a prison but a rehabilitation center or a hospital) "for a much longer period than the great majority of our ordinary prisoners do for ordinary crimes."

We, in this country, are beginning to get some feed-back from Georgia, where the Easter decision is binding. Although they have some 50,000–75,000 estimated chronic alcoholics, in eight or ten months they have got around to certifying only 200 of them as chronically ill and thus immune to arrest, and they are not sure when they are going to have time to examine the remainder. *The Wall Street Journal* tells us that one of the 200 certified alcoholics is the object of an attempt by a sister to have this certification taken away from him. Now that the police are prohibited from holding him, and no hospital facilities have been provided to treat him, according to the sister he can't be kept off the streets and out of the saloons: "He hasn't drawn a sober breath in six weeks."

Perhaps the most difficult aspect of this whole problem is that the lawyer who aggressively defends his clients and keeps them out of the clutches of the law sometimes seems not to care what happens after the defendant is freed. Lawyers often see the situation in terms of a battle, and, as long as they win, further consequences are not important. And the lawyer who has been most prominently identified with the fight to have alcoholics called "sick" and thus exempt from police supervision has said, never in his court briefs but in speeches to groups interested in civil liberties, that he doesn't think hospitals and medical facilities are the place for most chronic alcoholics. The implication is that when the battle has been won, as I think it will be won when the Supreme Court rules on the Powell case, to exempt alcoholics from the supervision of the police, the battle will begin to take them out of the domain of medicine also. Says Peter Hutt, "I have grave doubts . . . about the constitutionality of wholesale civil commitment of chronic alcoholics. We have not

fought for two years to extract DeWitt Easter, Joe Driver and their colleagues from jail, only to have them involuntarily committed for an even longer period of time, with no assurance of appropriate rehabilitative help and treatment, to perhaps a far worse form of imprisonment. . . . I would caution those who might rush head-long to adopt civil commitment procedures, and remind them that just as difficult legal problems exist there as with the ordinary jail sentence."

This discussion takes us quite far from hallucinogens and the use of marijuana, but it does involve a similar question, the right of the individual to live his own life according to the way he wants to live it and the responsibility of a helping profession like medicine or the responsibility of the state to deal with these matters in ways that will help society.

The controversy about enforced commitment will continue to rage, but it will no longer be a matter of concern to DeWitt Easter, who died a few months ago, not in prison, but in a hospital rehabilitation center when his bed caught on fire.

So, we have been considering two important issues: How seriously should we view marijuana? What attitude should we take toward addicts and alcoholics? And a number of questions have been raised: Can we afford to let the marijuana user drop out? Can we deal with addicts and alcoholics in the medical model? Should the medical resources we have on hand be given to alcoholics and addicts on a priority basis, or are they needed more for other uses? Should addicts and alcoholics be held for therapeutic purposes for indefinite periods of time when under criminal statutes they could have been held for only short and well-defined periods of time?

Perhaps a common theme that underlies all our questions is this: How far can a great society go in the toleration of differences and the protection of weaknesses?

(*Dr. Elkinton*) Thank you very much, Dr. Robitscher, for your clear delineation of these dilemmas. We have now arrived at the middle of our program. I'm not sure just how far the audience may feel that we have gotten with our problem. Perhaps we have at least begun to see some of the dimensions of the problem even if we haven't arrived at solutions.

Discussion

(*Dr. Elkinton*) We can now continue with the more informal part of the program. Each of our three panelists, in the order of their original presentations, will now have an opportunity to comment on the remarks of the other two before we throw this discussion open to questions that we have received from the audience. So, Dr. Farnsworth, you now have the floor to make any comments that you would care to make.

(*Dr. Farnsworth*) My first reaction to the comments of my fellow panelists was one of relief, because in the circles that I run most of the time I am disputed at every turn. First, because I am a physician and therefore biased because I see only the persons who have had trouble with drugs. Furthermore, I am told that I refuse to see the advantages of taking these drugs. Second, I am totally incompetent to make any observation about these drugs because I do not take them, hence am not in a position to speak about them with any degree of authority. On one occasion when a student was giving me a hard time, I said, "Would you feel more comfortable if I would start taking these drugs and have other physicians in the University Health Services do so in order that they might take more creative care of your physical and mental ailments?" Well, he thought maybe there should be some exceptions; perhaps physicians should not take them.

On another occasion when a student was dwelling on the advantages of marijuana, I said, "If *you* don't matter, then *it* doesn't matter very much whether you take it or not. But, if much is expected of you, if you are well motivated, if you have to use good judgment in your work and need highly sensitive

and perceptive reactions to what goes on, then you have most to lose."

Regarding Doctor Robitsher's comments on the A.M.A. statement, it seems to me that this concept of alcoholism as a disease is sometimes overdone. If we call alcoholism a disease, then why isn't there a disease labeled amphetaminism, or morning glory-seedism, or glue sniffingism (just to be ridiculous for a little bit)? If we have to name every disease after the chief mode by which symptoms are expressed, the whole thing becomes ridiculous. To be more exact, the chronic alcoholic is a person who has a strong medical, including psychiatric, component to his disorder. It also represents basic difficulties in his personality structure and, in later years, defects in his physiological make-up as well. This concept is very hard to state with any degree of clarity.

This is a problem which needs much discussion. We need the help of the legal as well as the medical profession. I welcome any questions or suggestions that you might have. We, who are now trying to advise the A.M.A. policy-makers (Doctor Brill and I and the others serving on the A.M.A. Council on Mental Health), would certainly like to have the backing and counsel of persons like Doctor Robitscher and many of the persons in this audience.

(*Dr. Elkinton*) Thank you very much, Dr. Farnsworth. Now, we will give Dr. Brill an opportunity to make some comments on the presentations of the other panelists.

(*Dr. Brill*) I have three comments, two of them minor, one I think of major interest. The first is that marijuana is often described, and has been referred to in our discussion today, as a weak hallucinogen. I think this is somewhat misleading; it is a dilute, not a weak, hallucinogen. If one works at it systematically and takes enough of a dose, he can get as much of a reaction to marijuana as he can to LSD. If you're interested in antiquities, Baudelaire's description of the hashish experience in his "Artificial Paradise" foreshadows the entire description of LSD action today, including the term, "taking a trip," which was invented by Baudelaire for hashish, and was not invented for LSD.

The second point is the question of the inadequacy of information. On an absolute level, our information with respect to each one of these drugs is inadequate. But, all things are relative, and we should see this in relation to our knowledge of pharmacology in general. I've heard Dr. M. Seevers say in very direct characteristic terms, "We don't know a damn about most of them." We don't even know how aspirin relieves headache. We don't know the pharmacodynamic mechanism of most drugs; we know them empirically for the most part.

Finally, it is most amazing that certain apparently obvious empirical facts about drugs have percolated through to the medical conciousness so slowly. For example, the dependence-producing capacity of LSD was first apparent to the boys on the street, and then the medical profession woke up to it. This is true of every one of the other substances that can produce drug dependence. It was first discovered non-medically and then it became obvious medically.

I already referred to my own lack of sensitivity in not being able to distinguish the facts about marijuana during a previous experience with it. Much depends on how sensitive the drug taker is and how sensitized the observer is.

The third point, and this was raised by Dr. Robitscher, I think is a key social issue. It has to do with drugs, but it has to do with a lot of other things. And that is, what will society do when something must be done, and when this action must be taken with respect to an individual who looks too much like a sick person to be put in a prison, and too much like a delinquent to be put in a hospital?

He has chosen his own illness, he makes himself sick by his own free will, and so we very easily get involved in an old philosophical discussion, and that is the question of pre-destination and freedom of the will transformed into scientific terminology.

We are now facing a series of judicial decisions, which in effect require that society or science or medical science shall produce effective treatments. They create a dilemma whose horns almost touch and leave very little operating space. On one hand, it is wrong to hold an individual against his will and keep him in a closed institution; on the other hand, it is impossible to leave him to injure himself or others and worse to discharge him from custody in the face of serious hazard. Something must be done. The only answer is an effective treatment. This seems to be required by the present set of judicial decisions and laws that are closing in from both sides.

I have the rather uncomfortable feeling that, if we do not create better treatments and if all conditions of this class are made completely medical problems, they will flood medical facilities and preempt all medical services. Such a system obviously is destined to fall by its own weight.

A third alternative is available, and is already being experimented with, and that is to devise an intermediate system which is neither correctional nor medical, but has characteristics of both, and which may apply a needed degree of compulsion for limited periods of time in an attempt to see that treatment is taken. Hopefully, this will be within our social capacity, and, of course, this is exactly the kind of effort which is now being undertaken in New York, through our own Narcotic Control Commission.

I think that society has the expectation that if a condition is an illness, it can be treated, and also that if it's an illness it has biological aspects, and so it is open to biological research. On this point I am firmly optimistic even though that may be taken as an indication of mental weakness.

I think that there are biological elements that are approachable, and perhaps some biological approaches will put us in a position to deal with these problems on a large scale. I need only call your attention to the development of narcotic antagonists, which now are a practical possibility. We now await only the development of an antagonist which will be long-enough-acting and sufficiently nontoxic. The theory has been worked out. Only the practical details of pharmacology and chemistry remain.

(*Dr. Elkinton*) Thank you, Dr. Brill. I hope you didn't take my remark about optimism to indicate mental weakness. As a natural optimist, I don't agree with that at all. I think that everyone here is grateful that your ideas have an element of hope in them. Dr. Robitscher, would you like to make some comments?

(*Dr. Robitscher*) I enjoyed very much Dr. Farnsworth's and Dr. Brill's presentations, and I got a good deal of information that was valuable to me. I thought that Dr. Farnsworth really pierced through a great many of the rationalizations which "kids" present to us and which we very often find difficult to answer. If they claim they are having a new experience or a better experience, or seeing truth in a new way, they make us feel very guilty if we want to deprive them of this. I think Dr. Farnsworth has helped me resolve some questions that I had in this area.

I like his emphasis also on the destructive aspect of many of these movements. Really, their ultimate aim is to burn down our institutions in the hopes that something better will arise from the ashes. I think when we view it in this way, it sounds a little melodramatic, it sounds as though we're maximizing a problem. But, I'm increasingly getting to feel that this is one of the basic issues here.

His statistics on drug use interested me a great deal, because these are pretty much the same statistics that the University of Pennsylvania student newspaper came up with recently. President Harnwell, before the State Legislature, asking for funds for the University, was questioned as to whether 30% of the students at the university really used drugs, mostly marijuana. He said he had very little faith in those statistics. "I have a suspicion about everything I read in The Daily Pennsylvanian."

I think it's very helpful to collect figures and to know what problem we're talking about. It is good not to minimize the problem, because I think the problem of marijuana-taking has reached epidemic proportions in Florida high schools and in other parts of the country. I'm sure we will be feeling even more of its effects in the near future.

To that extent, I quarrel with Dr. Brill, although I like his optimism and I just wish I could share it. I don't think the problem will fade out. I think that somehow in this problem a lot of the issues of our times have become symbolically represented, very much like the Vietnam war situation. Things seem to polarize in regard to this issue.

I have nothing more than hunch to go on, but I just feel that marijuana is going to be an even bigger problem, and that we're going to have much more trouble with it before it fades out.

I was interested in Dr. Brill's example of the "panic state" that had resulted from the use of marijuana. I noted a recent article which said that the reason there are so many "panic states" is that the psychiatrists don't know how to deal with these problems. Were you aware that somebody has written recently that in other parts of the world when these "panic states" and depersonalization feelings result nobody takes them too seriously? They give the taker support and a little care and attention, and it's over in a day or two. But we get panicked because we think the panic state is like a schizophrenic episode, and we put them in a hospital and there they stay for months. I think this is an argument that is going to be thrown at us increasingly, that psychiatrists are maximizing things that are perhaps not major psychotic reactions.

(*Dr. Farnsworth*) A new form of the Hershey argument.

(*Dr. Robitscher*) Right.

(*Dr. Elkinton*) Would you like to make any further comment on this assessment of the panic situation, Dr. Farnsworth?

(*Dr. Farnsworth*) I would like to read a letter, eliminating the details that might invade privacy. This student writes to the Comptroller in answer to a letter from the University urging him to pay his student loan. "I write about my loan account. Since 12/21/65, I've been a patient at the . . . State Hospital, recovering from a nervous breakdown triggered by LSD injections which began while I was associated with Professor "X" as a research assistant in my junior year at college. While I have every intention of paying the University in full for this generous assistance, I must at this time ask for a break. At present the prospects for a release from the hospital are good. I probably will be working again early in 1968. Can you perhaps find it in your heart to make a decision favorable to me in the midst of these deplorable conditions? As I have pointed out, I will probably be able to resume payments within 2 months. As the matter stands now, I have absolutely no idea how to make payment under the present terms. This mental illness has taken a long time to clear up. When I worked in LSD research at the college I had no idea of the possible side effects. I certainly never anticipated a personal encounter of psychosis. Can you please make some reply with perhaps information about an alternative payment schedule?"

To me, that is just an awful tragedy. Think of all the poignant elements in this situation! If this were an isolated incident I wouldn't be so angry. But, this is one of probably 40 from one institution hospitalized as the result of varying but similar ways of drug experimentation. Last year in San Francisco County Hospital, as I recall, there were about 600 people with psychotic episodes admitted per month. Bellevue has had a considerable number. These facts are looked upon as trivial, a low percentage, and I think we need in this country a great deal of the proper kind of indignation at the indifference of the medical profession, and particularly at many of our people on our faculties of the colleges and universities who set themselves up as experts in this field. One of my colleagues in Boston, the late Charles

Curtis, said, "One of the marks of maturity in an educated man is to know that when he departs from his range of competence he is no longer an expert." We have an incredibly large number of people in our schools who set themselves up as experts in fields in which they have no knowledge whatsoever.

Questions

(*Dr. Elkinton*) Dr. Farnsworth, I think perhaps your remarks might lead into the first of the written questions, which I have here. As I sit and look at this audience, I am conscious of the fact that there isn't a clear-cut division between the "we"—the middle-aged or older who are here—and "they"—the younger generation who are completely outside. There are young faces here, and we are delighted to have you younger people with us. Perhaps this first question reflects the fact that we are not completely polarized by generations with only one pole here. The question asks: *Since most of the problems expressed here today are based on decaying social and moral attitudes, has there been any move on the part of the medical profession to lead studies to get to the root or heart of drug misuse, or at least to aid social agents in helping avoid abuse of potentially dangerous substances?*

Well, there's a certain assumption that's put forth there that we can argue about and that we already have touched upon, but really the heart of this question is in the latter part. Would any of the panelists like to comment on this? Dr. Brill, would you like to say something? I know you've been actively engaged in some pretty important organizations within our medical profession that have been trying to do something about this.

(*Dr. Brill*) I'm not sure if I have the full import of the question, but it brings to mind a situation in which not long ago I was on a panel with a law-enforcement agent and an educator. Finally, the law-enforcement representative said, "This is certainly not just a law-enforcement problem." The educator said, "This is not primarily an educational problem." They had me in a corner, I almost had to say, "It isn't just a psychiatric or medical problem either."

I think to put the responsibility for these broad problems on one profession would be a mistake. The medical profession has an important part to play, but this must be in coordination with those who are primarily involved with the moral and ethical issues. I think we probably would be most useful in supplying the professional and technical information which they and others need for their decisions.

(*Dr. Farnsworth*) Some people have been examining this issue very carefully during the last few years. A number of programs are designed to get at this. But there is a tendency in this field, as there is in the civil rights struggle, as there is in the Vietnam struggle, and as there is in so many areas, to attack those people who are doing the best they can but who do not have enough allies. In short, the people who are protesting so much about our value system are not really protesting against the values we profess, but they are protesting the fact that we don't uphold them. To that extent, I sympathize with the writer of this question. To quote myself here, "Young people are keenly aware of social injustice, the threat of nuclear war, and the ineffectiveness or the downright hypocrisy of many of those in authority. They are confused about authority because so many of them don't understand true authority and authoritarianism." So they attack both groups, that is, those that have authority and those that are authoritarian, without distinguishing between them. They are confused about authority, not clearly appreciating that responsible authority permits a democracy to exist, whereas irresponsible authority or authoritarianism is destructive to the democratic process.

The late Judge Learned Hand put it this way: "A society that sets about trying to achieve complete freedom for everyone ends with freedom only for the savage few." That is the lesson that we all need to learn. To

return to the idea that "As a result of their confusion they often tend to reject all authority," sometimes their criticisms of society become so generalized that they reject most conventional values, refuse to participate in a system they see as pernicious and focus instead with drugs, Vietnam, etc. as their instrument, on their own subjective values. These self-defeating kinds of protest tend to bring out the resistance from the extreme right. There are many more people on the extreme right than on the extreme left. You can't tell the difference, of course, when they are together unless you see where they came from. But that's another matter.

If students would fight for their principles intelligently they would make better students of the people they are trying to influence. If they would get together with those of us who are trying to help, we could confirm Doctor Brill's optimism. But, if you who are young, keep attacking those of us who are older indiscriminately, and if we who are older continue discounting what you say indiscriminately, we will both lose.

(*Dr. Elkinton*) Thank you, Dr. Farnsworth. I think we should not take the rest of our time discussing the degree of decay of our social and moral attitudes because this is obviously something on which there are many different points of view. But, I would just like to add the comment that Dr. Wood made as we were walking over this morning from breakfast. He said he thought that there was one difference between our generation when we were students and the students of today. The student of today does not feel that he can plan for the future in the way that we thought we could plan for the future because of the obvious state of unsettlement in the world today due particularly to the nuclear threat. I think we are all conscious of this background of extreme unrest and uncertainty that to me is a very real reason for what has been called from on high "restlessness" in our younger generation.

Now, perhaps we might go to another question that touches on the more practical idea of what physicians are doing. One question here asks: *Dr. Brill, would you care to comment on the drug treatment program known as ENCOUNTER?*

(*Dr. Brill*) Just very briefly to say that this is one of the voluntary activities. It's new, it's enthusiastic, it makes use of the cooperation of the addict. For those people who are willing to join up, I think it has values. It is one of a whole series of voluntary activities, and the one thing that they all point up is that the prognosis for narcotic addiction is not uniform nor nearly as bad as it is often said to be.

(*Dr. Elkinton*) Thank you. Dr. Robitscher, I have a pile of questions addressed to you, but I'm going to hold off just a minute and ask Dr. Farnsworth to comment on this interesting question: *What became of the results of Drs. Leary and Alpert's early research with LSD, psilocybin, etc., on students and convicts at Concord? Has the early optimism of the "positive" results been verified by follow-up studies? Have there been any studies on the graduate students as to what became of them?* Perhaps the letter that you read to us earlier almost answers this question.

(*Dr. Farnsworth*) The net result of all the "social" experimentation with psilocybin and LSD has been a series of tragic events. Even some of the LSD work done under responsible sponsorship has resulted in seriously impaired lives among the volunteers who participated.

(*Dr. Elkinton*) I am now going to ask Dr. Brill two questions that are quite closely related and that he might consider together. The first is: *What are the possibilities of developing criteria for the early identification of potential drug abusers?* The second question is: *Is there in existence a recent review article on the clinical picture of cannabism, that is, characteristic long-term effects, patterns of vagabondage therefrom, and acute physiological and psychological effects?* We have a scholar in our audience.

(*Dr. Brill*) As far as identifying potentially drug-dependent persons are concerned, I don't know of any promising advance. This is part of the general problem of predicting

human behavior, which is so far essentially unpredictable. In general, one can say that certain unstable individuals tend to be vulnerable to drugs. But, very fortunately only some unstable individuals are vulnerable; the marjority are not at all vulnerable.

One thing is sure, if an individual shows a propensity to become involved with one drug, he's at risk with all other drugs of dependence.

In reply to the other question about the review paper, I think a good place to start is with the paper by William H. McGlothlin. It is part of the pro-drug *Marijuana Papers*, published in paperback by Signet, but is well balanced and has a good list of references. Another good paper which is also a source of references is the paper by J. M. Watt on "Drug Dependence of the Hashish Type" in the Ciba book, *Hashish: Its Chemistry and Pharmacology*.

(*Dr. Farnsworth*) One of my colleagues, Dr. Preston Munter, reviewed in great detail the records of 36 patients of ours who had used LSD and marijuana, singly or in combination (really there is not very much difference). Low dosage of marijuana tips only a few people over and a higher dosage will tip anyone over. Here is his summary:

"In summary, then, the significant factors of that portion of the student population that uses drugs on more than a casual basis are as follows: 1., A family that includes a particularly stressful relationship between parents, rejection of the drug user, and a severe struggle between the drug user and the parent of the same sex; 2., A high level of intelligence; 3., Defective self-image, decreased self-esteem, and serious disruption of the process of psychosexual identity; 4., Distorted expectations and severely "askewed" self-entitlement. (Meaning, in my terminology, 'He thinks he owns the world;' or, as Kingman Brewster says, 'He doesn't give a damn who owns the world.' Either way, the world owes him everything.) Finally, 5., Seriously disordered interpersonal relations and inappropriate, ineffective, or inadequate impulse expression."

That sizes up the opinions of all of us in our department.

(*Dr. Elkinton*) Thank you for this very complete summing up of that particular question. Now, Dr. Robitscher, perhaps we might ask you a question. *If over 40% of our college population has had experience with marijuana, is the enforcement of criminal prohibitions practical, and, if not, what would be the effect of these laws on the attitude of these youths toward the legal system as a whole?*

(*Dr. Robitscher*) That is a very compelling argument, which I didn't get into today, but which I should have. A lot of people compare the marijuana problem with alcohol, and they look at our experience with Prohibition as an example of what happens when we, by law, prohibit substances which are capable of giving potential pleasure and which have a great deal of meaning for people. And as you all know, Prohibition worked out miserably, and many people feel that the whole growth of organized crime in this country—gangsters, the Mafia and things of that sort—go back to the period of Prohibition. So the argument is made that if we outlaw marijuana (as we now outlaw it), and if we take a very stringent attitude towards it and try to enforce the laws more effectively, we're going to make it more attractive, because forbidden fruits are always sweeter, and we're going to hurt the general attitude of people toward law and law enforcement.

This is a question that I really can't quite answer. It seems to me that, if you have prohibitions and you believe in them seriously and you effectively implement them, you build up respect for law. If you don't effectively enforce the law, you destroy respect. Whether or not, if we try harder to control marijuana use, more or less respect would result is hard to predict at this point. I would be in favor of more efforts to enforce the law, and I think this might build up respect. But people who say that you'll have

the same situation as in Prohibition have some logic in their argument, too.

(*Dr. Elkinton*) Do either of you gentlemen care to speak about this?

(*Dr. Farnsworth*) I'd like to ask you whether, if the penalties for the use or possession of marijuana were lessened to the point of where they could be enforced, and particularly if we got public opinion to support such enforcement, that would be more effective than our present too stringent laws which are logically impossible and which cannot be enforced?

(*Dr. Robitscher*) One of the real problems in marijuana enforcement has been that the penalties have been so severe—five years in jail—that a police officer is reluctant to throw the book at somebody that he finds using marijuana. I think that you can't have effective law enforcement while you have laws in effect that are so punitive. I think the penalty has to fit the crime, and certainly I don't think the crime is worth five years in jail. On the other hand, I think that the law's penalty has to be sufficient so that it is a powerful deterrent. It's hard to say—perhaps psychologists can tell us—where the most effective deterrent will be. Certainly five years in jail is a travesty.

(*Dr. Farnsworth*) I'd like to try my pet scheme on this, namely, the first offense of using or possessing marijuana should have as its penalty five to ten days in jail and a fine not to exceed $100. If the offense is not repeated, then it is not made a part of the person's permanent record and it doesn't keep him out of college, it doesn't keep him out of a career, etc. If, however, he does repeat it, the penalty is quite markedly increased, and if he again repeats it, then the offense becomes a felony. What would you think of that kind of an arrangement?

(*Dr. Robitscher*) I think it sounds very rational, and it fits in with our policy of law enforcement, which is that we really don't want to put first offenders into prison and get them hardened to prison conditions and turn them into hard-core people. We want to use our laws as a deterrent and use the punitive power of the law to the littlest extent as possible.

(*Dr. Farnsworth*) In other words, the laws ought to be used as instruments for learning, for education. And they should be as mild as possible to achieve the result, but severe enough to get the individual to realize that, to quote Winston Churchill, "Up with this, we can no longer put."

(*Dr. Elkinton*) Dr. Brill, you expressed an opinion on the point earlier this morning about the law and its effect expressing the attitude of society.

(*Dr. Brill*) I thoroughly agree with what's been said about the intensity of penalties. As I understand it, the deterrent effect of penalties is not proportional to their severity; it is proportional to the certainty with which they are applied.

But, let me make one point about straightforward legalization. I think a message is carried to the population at large by legal action; if there is a law against something, this carries the implication that it is harmful. If something is legalized, this carries the implication that it is harmless and that society has approved it. I think it would be a terrible mistake to put the message across to the younger people that this *is* a harmless thing.

(*Dr. Elkinton*) Here is another question directed to you, Dr. Robitscher. *Your major argument against decisions, such as the Weinrott decision, appears to be that we neither possess the medical manpower nor the knowledge to deal with the problem. Historically, it appears to have been the case that medicine has developed effective methods for these conditions which are socially defined as being in its province. It is a certainty that this is the only means by which medicine will come to grips with the problem. Is this not a necessary step, then?*

(*Dr. Robitscher*) This was the philosophy of Judge Bazelon in Washington at the time of the Durham decision and it is his philosophy in some other recent decisions. He felt that if we redefine problems as medical, even

though we don't have the facilities to treat them as medical, and turn them over to the doctors, then the doctors are just going to have to do something about it. The legislatures are going to have to appropriate money, and the problem is going to be taken care of in that way. That's the argument he has used for a number of his decisions. I think this is irresponsible. I think that if you want an effective program set up, you get a legislature to debate it and to give money, to appropriate for it, and you set up institutions —at which point, then, I think it's appropriate to change the law and start dealing with people differently.

But, I don't think you can just make doctors assume all sorts of sociological problems just by redefining them as medical problems. I think that doctors have some degree of control over how they want to spend their time and their energies. Just because a judge wants to state that this is a medical problem doesn't really force us to deal with it as a medical problem.

(*Dr. Elkinton*) I have a few more written questions up here, at least one of which is in the same handwriting as one of the questions I've already read. It seems to me that we might perhaps see whether there are any further questions from the floor that any of you would like to address to the panel. We are trying to save the last fifteen minutes for a summary by each of our three panelists. So, I would like to see if anyone has a question. Dr. Elsom.

(Dr. Kendall Elsom) *Dr. Farnsworth talked about the ability of the young generation to see through the phony reasoning and arguments that the older generations use. This raises the question of chromosomal derangement. I would like to ask how valid this argument is. I've heard someone from the N.I.H. say that aspirin causes about five times the number of chromosomal derangements as LSD. With our present knowledge, how firm is this argument?*

(*Dr. Elkinton*) I would like to paraphrase this question for those of you who may not have heard it. Dr. Elsom essentially asked how firm is the evidence that LSD produces important or significant genetic damage? This, indeed, was also the question of one of the written questions submitted, which also asked how firm are the data on chromosomal damage with LSD?

(*Dr. Farnsworth*) An article in the October 1967 issue of the *Lancet* described a girl in Iowa City who had taken LSD during the first trimester of pregnancy and produced a child with a defective right leg. Another individual had a microcephalic youngster. I don't think the findings suggest that aspirin produces more chromosomal disarrangement. It may be true that there are five times as many cases reported, but there is also a vastly greater number of people who use aspirin than LSD. My colleague, Dr. Hermann Lisco, who is working in this area, feels very uneasy about what is going on with LSD users as he watches the degree of chromosomal disarrangement occurring with users of various drugs. Therefore, I think it would be quite unfortunate for us to say that it has been proven that there will be birth deformities, but we can say that there are deformities beginning to occur in which the cause is not known, unless LSD is the agent, and that it would be wise to be very cautious.

(*Dr. Elkinton*) Is there one more question?

(Dr. William Peltz) *I think we all agree with everything that's been said about LSD and its dangers. In talking to students in school, questions come up about the dangers of marijuana. How to convince these people is still a puzzle, so far as I'm concerned, in answering their questions. I'm deeply against its use for the high school and college kids, but I do not know how to answer their questions about its dangers. I'm not talking about big overdoses. What does one say to the young people people who advocate the occasional use of marijuana, not the steady use of marijuana, as to its dangers and its undesirability? What can a physician say to them from the medical point of view and not the moral point of view?*

(*Dr. Farnsworth*) It is hard to give an answer to that question which satisfies either ourselves or our questioners. I try to answer it in

this way. The occasional use of marijuana introduces one to the "we happy few" culture, or to the "true believers" culture, and if the individual uses marijuana only as an experimental thing, in a sense, the chances are that nothing harmful will happen to him from a purely medical point of view. Of course, he may have the same experience of the girl seeing a truck in front of her as she was driving home. She realized it was there but the next thing she knew she was being picked out of the wreckage, unhurt, but her automobile was completely wrecked. Another person ran off the road after using marijuana because he got "hung up" on a girl. They got to thinking these grand thoughts and so reacted inappropriately.

Some of my friends in sociology say these things do not happen; unfortunately they do. They argue, "Well, if you drink too much, the same thing will happen." Nevertheless, I maintain, and here I am on somewhat uncertain grounds, that there is more danger and certainly a difference in reaction. On one occasion in speaking to members of a club (no one in the history of this particular club has ever had trouble getting home), I said, "Here we are at this meeting tonight, and all of us have had cocktails; we are all feeling quite good, and we are all having what we think tonight (not necessarily tomorrow) is scintillating conversation. It has been a facilitating social experience. However, if we were all on marijuana, we would feel just as good, but (to use a current slang phrase) we would be contemplating our navels, or, as one boy said, 'I have the whole world right in my lap.' It is an inhibitor of conversation; it makes a person feel more intimate and yet act more removed; and so, as a social facilitator, its effects are quite different from those of alcohol."

(*Dr. Brill*) I might add one more thing to what Dr. Farnsworth has just said. While as physicians we can't speak on a moral level, we can speak on a public health level. In order to make an occasional marijuana cigarette available to the young man who is well-nourished, well-placed and a person who can stand it, we must also make marijuana available on the open market to all sorts of people who can't take it.

I can't go along with the idea that we should sacrifice the vulnerable people for the doubtful pleasures an occasional marijuana cigarette brings to the less vulnerable.

(*Dr. Elkinton*) We're supposed to be winding up about now. However, if there is a short question, I will entertain one more question.

(Dr. Donald J. Ottenberg, Medical Director, Eagleville Hospital and Rehabilitation Center) *There is a kind of homogeneity of opinion here that doesn't really reflect the problem. There is a great deal of dissension and controversy. I would like to make two points. First, much of what Dr. Robitscher has said is of great interest and value, and especially his point of view about the nicety of the problem of defining alcoholism and drug abuse as a legal issue, but he gives a feeling of hopelessness about dealing with these problems in a medical way, which I think is very out of date. As one who helps to run a hospital for alcoholics, I'm a little resentful of having it identified as a prison. It is far from being a prison. It is a place where we are feeling a good deal of hope and encouragement about solving some of these problems.*

The other point is about the stance and the strategy of the panel. Much of what they say I agree with. But the position they take, I think, just does not come off to the people that we ought to be addressing ourselves to, and they are the young people who are having this problem. The need is not so much to define the differences, not to point out over and over again the harmfulness of LSD. Those of us who have teen-age kids know that those kids are aware of the grave dangers in using LSD. But the question of marijuana use we pass by, just as we are unwilling to face the issue with alcoholism in this country and the problems it creates. I would simply submit that we should make an effort to define the areas of agreement with these young people. There are many things that they are saying, many of their impulses, many things they are attempting to do that we agree with, and we ought to be defining those areas of agreement.

That might start a dialogue which would get them listening to us.

I don't think they would listen too much to the sort of dialogue that comes from this panel. Not that it isn't true, not that the things aren't based on fact and good experience, but I don't think that that's going to solve the problem that these kids have. They want something; they're asking a question about the values of this society. This is a problem that goes beyond medicine, of course. But it is for medicine to say what it is that society is failing to do that creates the drug problems that we all are facing.

(*Dr. Elkinton*) Thank you for your comment, which is a very welcome one, I think, in trying to give this a very balanced presentation. We obviously can't take the time to go over the program and give this new slant. I see that Dr. Farnsworth wants to speak on this.

(*Dr. Farnsworth*) I couldn't agree with you more in that we do not know how to do that as well as we could, or should. Consequently, a part of the problem of developing programs of drug education is "How do we reach them," and most of us would agree with your suggestions, but the question is how do you do it? We have yet to develop truly effective educational programs.

(*Dr. Robitscher*) I think part of the basic problem, which we really haven't gotten into, is why so many of the younger generation feel that we don't care, why they don't respect our experience. These young people really don't feel that we want what is in their best interest. They doubt us. This problem probably has always been with us, but right now it seems to be more visible than ever before. Why it has come about is a question I just can't answer. It may have to do with a society that's becoming more passive as a result of television. It may be that doctors rely so much on prescribing drugs, and have particularly since tranquilizers came in, that young people think that taking something by mouth, ingesting something, is the answer to all their problems. It may be that we can't have a cocktail party or have three martinis every night before dinner and still tell our kids you should deprive yourself of marijuana. But, nevertheless, agreeing with all that, I still think that unless we care very much what happens to them, nothing good is going to happen to them. And even though they're not going to agree with our standards I think we have to find the standards that we're comfortable with and insist on them, even though there is going to be conflict as a result.

(*Dr. Farnsworth*) One thing that has to be remembered is that the drug takers are a relatively small proportion of the total population. We have many allies among our young people, but many in this group are changing with each new class. It is a greater problem with each new freshman class, no matter what the school, and the same thing is true of the first year graduate students.

(*Dr. Elkinton*) I would like to say, as a parent as well as a physician, that we have to look with greater sympathy and with a closer scrutiny at what these young people are telling us is wrong with our society, because our society isn't in such "hot" shape. We have to be very careful to acknowledge this before we start stressing the undesirability of certain responses that they are making. This means sympathy, this means understanding, this means doing our best to keep the lines of communication open.

We will now draw this symposium to a close with a brief five minute summary by each of the three panelists. Dr. Farnsworth, you were the first speaker; would you care to make a final comment?

Summary

(*Dr. Farnsworth*) An appropriate quotation comes by way of a former colleague of mine at the John Winthrop House, who was perhaps over-reacting to some of the certainties of some of our students when he quoted a former Master of Trinity College as saying, "No one of us is infallible—not even the youngest of us." So, we have to keep in mind when we are dealing with such massive certainty on both sides of this question that

we have to break through and get down to what we have in common, rather than concentrate on our differences. What we have in common is that we would all like to survive; and to survive with lives that have meaning and purpose.

My summary will be short. We desperately need the thinking of all kinds of people throughout society: the clergy, the governmental people, the legal professionals, the teachers, the parents, and more particularly the young people themselves. Young people need the stimulus of coming up against the ideas different from their own stated by many people who are honest, who are trying not to be hypocrites and who have definite standards. They do not need our wholehearted agreement. They will evolve a much better system of values if they fight with us in a friendly fashion as to which ones of our standards are "poor" and which ones are "impossible" and which ones are "desirable" and which ones are "highly desirable." The outcome will be better if they don't encounter ethical relativism at every turn.

One of the main defects in our present society is that there are so few people who believe in anything with enough conviction to stand up and say so. I am not talking about the "fanatics." Professor Santayana described a fanatic as "one who redoubles his energy after he has lost sight of his aim." We have plenty of those.

People who are not rigid, who do say what they mean and mean what they say and who are basically friendly to young people, are in a better position to help young people formulate values that are better than ours and yet not destroy what is good in our society. It is not "who" is right but "what" is right that counts.

(*Dr. Elkinton*) Thank you, Dr. Farnsworth. Dr. Brill, would you like to summarize?

(*Dr. Brill*) Well, I think I can summarize very briefly. It seems obvious that the course of public action is going to be determined by public attitudes, and this still remains open for general discussion. For that reason, the kind of discussion that we've carried on here, the kind of discussion we carry on with young people is terribly important, because changes in public attitude will undoubtedly be reflected in changes in law.

For that reason, many of these rather dialectical points that seem to be so persuasive need to be explored, need to be examined and evaluated. One was brought up just a moment ago, and I'd like to return to it in closing, and that is the futility of prohibition.

One prohibition law failed, but it seems to me there is a whole body of law that prohibits all sorts of things and makes our society possible. So that, one cannot generalize that all prohibitions are ineffective, because one type of prohibition failed. I can cite one even in the field of drugs; absinthe disappeared as a result of a prohibition law against absinthe in France. In Japan, they had a serious epidemic of heroin and pill use, and they applied a prohibition law and the latest reports from Japan are that they are getting this under very good control. In fact, faster than we are.

I have not lost confidence in the capacity of law to contribute to our social structure.

(*Dr. Elkinton*) Thank you, Dr. Brill. Dr. Robitscher, would you like to summarize?

(*Dr. Robitscher*) I think that our whole discussion indicates how complicated the problem is and how valid different points of view are. I think that, as Dr. Brill just indicated, the value of a meeting of this sort is that it creates discussion, and promotes communication, and the dialogue continues, and new ideas and new thoughts are produced on the subject.

I'd like instead of summarizing what I've said to read some sentences from the American College Health Association's recent "Position Statement on Drug Abuse" which summarize my feelings: "Despite the fact that any regulations which are in the public interest may abridge some individual freedom of choice of the ways in which we may influence our lives, there is no substantial denial of the wisdom and justification for

there being social controls. This is especially true in the case of substances which have actions that are poorly understood and effects that may predispose them to misuse or abuse."

(*Dr Elkinton*) Thank you, Dr. Robitscher. I will conclude by saying that it seems to me that we have tried to do here this morning what needed to be done, namely, to have a discussion in which the representatives from different professions and segments of the public have come together to share their thoughts about these difficult problems.

After all, these grave questions, which are legal, moral, and social problems as well as medical problems, must be decided by an intelligent and informed public opinion. I hope that this symposium will have contributed to the growth of such an informed public opinion.

Dr. Wood, as President of the College, would you like to adjourn the meeting?

(*Dr. Wood*) The meeting stands adjourned. Thank you all for a perfectly marvelous symposium. I have never heard anything to equal it.

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History of Child Psychiatry
I. Frederick H. Allen, M.D., Child Psychiatrist[1]

By WILLIAM C. ADAMSON, M.D.[2]

Mrs. Allen, Dr. Tondreau, Dr. Gianakon, Fellows of The College of Physicians, and Friends:

It was with a deep sense of humility and a fervent hope that I might capture, for these moments, the greatness of the man, that I responded to the invitation of the Section on Medical History of The College of Physicians to bring to this meeting a brief sketch of "Frederick H. Allen, M.D., Child Psychiatrist." Fred Allen was not a citizen of Edwin Abbott's *Flatland,* that allegorical community in which its inhabitants lived and thought in a two-dimensional world. He was a man who was profound in the depth of his human understanding and warmth, inspirational in the breadth of his spontaneity, and outstanding for the heights to which his creativity soared over four decades of active practice as a child psychiatrist. As a consequence of his three-dimensional thrust into this specialty of medicine, Fred Allen has often been referred to as the "Dean of Child Psychiatry."

Prologue 1925–1930: A Capacity for Growth and Change

As a background for his contributions to the field, Fred Allen brought with him a deep conviction about the individual's capacity for growth and change. Born and educated in California prior to the turn of the century, he completed work for his M.A. degree in Psychology at the University of California. While still a student, he went to Stockholm, Sweden, in 1912, representing the United States Olympic Team in the running broad jump. He placed fifth in these Olympic Games, having placed first in that event in this country in May 1912. After graduation from the Johns Hopkins Medical School, he was strongly influenced in his psychiatric training by Dr. Adolf Meyer. The early work of G. E. Coghill (1929, 1930) on the process of biological differentiation also became a cornerstone in his theoretical formulations as to the nature of personality growth and development of children. Over the years, Dr. Allen emphasized that the child's biological and psychological growth processes within the structure of the family were characterized by recurring cycles of separation, differentiation and integration into new and emerging roles appropriate to the child's biologic and social status.

In his paper on "Dynamics of Roles as Determined in the Structure of the Family" (1942), he wrote:

> Growth cannot be viewed solely as the organization of the instinctive life under the restricting influence of the outer world. This view emphasizes that one is outer and the other inner, rather than accepting them as part of a whole.

For him, the goal of the individual's life process, as well as of the therapeutic process, was to help the individual become himself in a world of different human beings. He stressed that such a goal was possible "only as the individual feels and values his relatedness to others. Being an individual car-

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ries a responsibility to the group as well as to the self" (1942). This was the stuff, the stance and the style of which the first Director of the Philadelphia Child Guidance Clinic was made.

In viewing the years 1925 through 1930 as a prologue to his career in child psychiatry, one can foresee a capacity for greatness. From the time he began as Director of the Commonwealth Fund Demonstration Clinic in May 1925, he brought to that Clinic, its staff and to the community of Philadelphia the qualities of leadership, organization, spontaneity, humanness and warmth—all of which were to characterize his thirty-one years as Director of the Philadelphia Child Guidance Clinic. A colleague recalls early in her career asking at the information desk of one of the Orthopsychiatric meetings how she would be able to recognize Dr. Allen so that she might have her interview with him about the possibility of training at the Philadelphia Clinic. She was told, "You will know him without my pointing him out, for he is such a nice person, and he smokes a pipe." This anecdote reflects the affection which his colleagues had for him even from the earliest days of his professional career.

Beyond this, he had the capacity to attract capable and creative people to him and to grow with them through mutual respect and recognition. He was justly proud of his wife, Madell, and of her singing ability, and many of his former trainees and friends can recall nostalgic moments at the Franklin Inn when Dr. and Mrs. Allen would host these groups. Also, in those early formative years of the Philadelphia Clinic, he worked with and later selected Miss Almena Dawley as his Chief Social Worker and Dr. Phyllis Blanchard as Chief Psychologist. It was from the collaborative effort of these three exceptional people that the Child Guidance Clinic Team-Approach took form and became the model for treatment in child psychiatry in America throughout the first half of the twentieth century. Significant in the background of this Child Guidance Clinic movement in the early 1920's was the contribution of Drs. Jesse Taft and Virginia P. Robinson of the University of Pennsylvania School of Social Work. These able social work teachers, along with Dr. Kenneth Pray, then Dean of the School of Social Work, had made some real steps in the organization and definition of the function of the social case worker in the emerging mental hygiene movement. Dr. Robinson described, in a personal communication, the sense of excitement and dedication which led to a very close and constructive relationship between the Philadelphia Clinic and the Pennsylvania School of Social Work:

> We needed a Child Guidance Clinic and welcomed it. Miss Dawley had come to the faculty of the school to teach research, but, when Dr. Allen began to explore the possibilities of finding a chief social worker for his clinic, it soon became obvious to those of us on the faculty who knew Miss Dawley well that she was exactly the person whose gifts with children and whose skill in training and research would bring what he needed. The school and the clinic made a deal, as they say. We gave Miss Dawley to the clinic, and in return Miss Goldie Basch Faith of the clinic came to the school faculty. From that time on to their retirement, the collaboration between Doctor Allen and Miss Dawley was one of the rare relationships out of which a true helping service is created. It was the kind of relationship that enabled the two agencies to work together from a common base of understanding of the problems of training and teaching.

The concept of supervision as an essential ingredient in the training of child psychiatrists received its direction and impetus from the process of supervision which had been developed at the Pennsylvania School of Social Work.

In the five publications which characterized his early writings from 1925 to 1930, one can see the presage and the promise of things to come. The first paper on "Psychic Factors in Juvenile Delinquency" (1927) focused on the key issue of the time which gave force and direction to community services for children. His other papers of this

period were directed toward parental education in terms of role definition and responsibility (1928), toward "The Emotional Problems of the Physically Handicapped Child" in a paper written in collaboration with Gerald H. J. Pearson (1928), and toward underscoring the importance of prevention, as well as treatment, in the nervous and mental disorders of childhood (1929).

Perhaps the paper, "Evolution of our Treatment Philosophy in Child Guidance" (1930), points up best what he and Miss Dawley had come to see as central issues in the treatment of emotional disorders of childhood and casework for puzzled parents. In this paper he emphasized the importance of looking at causal factors in the child's behavior rather than focusing on and attempting to suppress or change the behavior *per se*. He cautioned that star charts and semi-moralizing were futile ways of effecting growth and change in the child. The need was for a more direct approach to relevant factors operating in the parent-child relationship. He encouraged parents to discuss and work out important factors themselves, giving them insight as they appeared ready to work out and to accept their part in the interpersonal relationship conflict. For example:

> The fewer specific suggestions given to them for handling this or that type of child reaction, the easier it will be to re-establish their confidence in themselves and their own maturity, so they will be able to decide those specific points themselves.

It was also in this paper that he struck the dominant and harmonizing chord which was to become the hallmark of his own treatment philosophy: "Children can be helped to help themselves." In this helping process he emphasized the unique value of the child and his genuine respect for the child's parents. He also carried into the treatment process a strong, positive feeling about the capacity of both parent and child to change in proportion to the degree of problem within the family members and in response to the degree of clinical skill which could be made available to the family unit.

Dedication and adherence to these principles was admirably summed up in his reply when he was once asked the following question: "What did you and Miss Dawley have in common that brought you together in the Philadelphia Clinic?" Without a moment's hesitation and with a characteristic twinkle in his eye, Fred Allen replied, "We have together our ignorance and our commitment to understanding children and their parents and to seeking ways to help them to live and grow up together."

His path to greatness as a child psychiatrist, however, was paved with more than dedication and commitment. He had within him a quality of humanness and humility which allowed him to listen to parents and children and to learn from them. The story is told at the Philadelphia Clinic of an interview which Dr. Allen had with the father of an emotionally troubled boy. The staff had carefully formulated six points of treatment which they felt essential in order to help the young man grow. The sixth point was that the son should be separated from the father through a summer camp experience. After Dr. Allen had skillfully shared the suggested six points, the father agreed that he could certainly go along with the first five points which the staff had recommended. However, it was the father's feeling that he was just beginning to establish for the first time a healthy relationship with his son, and he was very reluctant to give this up by sending the boy away to camp. After listening and weighing what the father said, Allen did not press the clinic's point of view upon the father. Rather, in reporting back to the clinic staff, he suggested, "It may be that he is right, and we are wrong."

A Decade of Differentiation and Individuation: 1930–1940

During the decade from 1930 to 1940, Fred Allen's own professional development

showed the quality of differentiation from the then current modes of treatment with children and a move toward individuation which established both his legend and position among the pioneers of child psychiatry. He became as forceful a beacon to the field as were Drs. David Levy and Lawson Lowrey of New York, Paul Schroeder of Atlanta, George Stephenson of the National Committee for Mental Hygiene in New York, Samuel Hartwell of Worcester, William Healy of Chicago and Augusta Bronner of Boston.

Three papers written during this period highlight especially well the theoretical and clinical issues which were assuming positions of primacy in his treatment model.

In his paper on the "Creation and Handling of Resistance in Clinical Practice" (1932), he made an interesting observation about the difference between child analysis and child guidance. He suggested that in child guidance one deals with manifestations of conflict in living situations, less frequently dealing with the "more deeply rooted sources of the conflict itself." He acknowledged that the psychoanalyst attempted to "touch deeper levels of the personality." It was his conviction that human beings coming to a clinic for help obtain not only relief but clarity through this type of therapy which it is possible for them to accept and for the clinic to give.

His paper, "The Dilemma of Growth" (1937), stated the two-fold human dilemma in this earthy and articulate way:

> The dilemma for the mother: How can she encourage creativeness in the product of her creation?
>
> The dilemma for the child: How does he acquire the courage to be a self, different and separate from the self that creates him?
>
> The dilemma will remain for each succeeding generation, but the solution will be found with less turmoil as the adult brings to this ever-recurring drama a sense of his own wholeness.

The third paper in this series, "Some Therapeutic Principles Applicable to Psychiatric Work with Children" (1937), underscored his belief in working with the child in what he called "the here and now." In this dimension of his treatment model, he aligned himself more with Otto Rank than with the classic model of child analysis as formulated by Anna Freud, Melanie Klein, Berta Bornstein, Eric Erickson and other child analysts:

> The therapist is not a part of the past, although the child may bring in the turmoil emerging from the past. But in doing this, disturbed feelings no longer belong to the past. They are in the here and now and can be dealt with by both child and therapist in terms of what feelings are now rather than in what they have been.

In the balance of this paper, he addressed himself to critics of this point of view, who suggested that the deeper turmoil within the child remained untouched. For Fred Allen, allowing the child's turmoil to be experienced as part of the immediate treatment situation was the more difficult and disturbing therapeutic task:

> This is where the psychiatrist has entered the life of the child to help him create an immediate relation that develops its own realities with values and limitations.

Dr. Eveoleen N. Rexford, Editor of the Journal of the American Academy of Child Psychiatry, has written about him (1964):

> People trusted Fred Allen, and undoubtedly he was able to persuade certain of our sharpest critics to a more measured view of child psychiatry as much by the kind of person he was as by the knowledge and experience he brought to delicate negotiations.

In his spontaneous reply to what might appear an innocent question, we often heard him cut through to the heart of the issue. When asked, "Are you a play therapist?" Dr. Allen replied, "I am a child psychiatrist. I am not a talk therapist, a play therapist nor a relationship therapist. I am not even a child psychotherapist. I do talk with children. I use the medium of play to help them. I work with them in an interpersonal relationship. I also use the skills

of the psychotherapist. All these things are an important part of what a child psychiatrist does, but they are only part of the larger role of the child psychiatrist."

Some measure of his deep respect for human feelings can be seen on the occasion of an interview he had with two parents. The mother began to cry. The father scolded her and told her to stop. In a little burst of strong but sensitive feeling, Dr. Allen turned to the father and said, "Can't you let her have the right to her own tears?" It is told that on another occasion, following a conference with both parents, a mother turned to the father and said she knew everything would be all right, for Dr. Allen had laughed and made a light joke during the conference. He had successfully brought into an emotionally-charged situation his healthy degree of balance, optimism and abiding confidence in the capacity of this family to grow and change.

It was during this same decade that Fred Allen began to show on the national scene what Dr. Evelyn Alpern, one of his trainees and colleagues, has called "his clarity of thinking and organization in doing." In 1933 he was elected President of the American Orthopsychiatric Association. In 1936 he became President of the Philadelphia Psychiatric Society. His election to these offices served to herald in his life what might be referred to as a decade of self-integration.

A Decade of Self-Integration: 1940–1950

It was in the years from 1940 to 1950 that the strength, the capacity to differ in a constructive way, and his individuality began to crystallize in its creative form. During this decade, he became the author of a classic book in child psychiatry, *Psychotherapy with Children* (1942); he became concerned with both the necessity and the responsibility to teach and train others in the field, as shown in *Symposium, 1946: Training in Child Psychiatry;* and, he emerged as statesman and organizer for child psychiatry in the larger professional community. In doing so, he had successfully integrated his innate leadership and organizational capacities with his own unique gift of humanness. His colleagues recognized and reacted to these qualities by electing him President of the International Association of Child Psychiatry; then, by naming him the first President of the group most responsible for setting the standards of training and clinical practice in child psychiatry, the American Association of Psychiatric Clinics for Children; and finally, by including him in the Group for Advancement of Psychiatry which was also a pacesetter organization on the American psychiatric scene. In short, Fred Allen had moved from the status of pioneer in a new frontier of medicine to a central executive position in the development of theory, practice, training and advancement of child psychiatry at every level of its development.

His sensitivity as a teacher and therapist can be felt in all of his writing. The depth of his feeling went beyond the psychological issues to penetrate the world of philosopher and political scientist alike. For example, in *Psychotherapy with Children,* he wrote:

> The oft-quoted slogan, "In unity there is strength," holds but a half-truth. If unity is achieved only by the destruction of individual strengths that go to make up a social order, then the false unity becomes itself a new source of weakness. Real unity, whether in the family or in larger national groups, can only emerge as individuals find creative worth in their own differences, which thus enable them to "live and let live".... There is a great need in the world today for a philosophy, whether therapeutic or more broadly social, that stems from a recognition and acceptance of individual difference.... At a time when the world needs new orientation to the essential place of the individual, we need to emphasize the strengths of human nature and its capacity for self-responsibility.... When the child has been helped to affirm the value of what he is in an active, changing world, his major focus of interest has been directed ahead and away from the shackles of an outlived past. There is implicit in this an affirmation of a philosophy of responsibility, and a belief in the dignity of human nature as it exists.

In the role of teacher, he showed not only sensitivity but also a quality of humor which reinforced the learning experience for all those who studied with him. He would often illustrate his belief in the capacity of an individual to change by an anecdote on enuresis. This was the story of a young man and woman who were about to be married. The young man was a bedwetter. He told his bride-to-be about this, and she said it would not matter. When the couple was packing a car for their bridal trip, the bride-to-be came out with all kinds of rubber sheets and boxes of detergents. The bridegroom-to-be asked what they were for. The girl casually answered that they were to take care of his bedtime problem. The bridegroom-to-be declared he would never wet a bed again, and he never did.

In his contribution to Witmer's *Psychiatric Interviews with Children* (1946), he pointed out that without a belief in the capacity of a child to change, though the explanation of the change might not be obvious, the therapist could lose himself and the child in excessively rational explanations and interpretations which could

> unwittingly diminish or destroy the human and more spontaneous value of the child's experience, from which change emerges.... This is the art of therapy. Knowledge of the professional method is designed to serve and help, but not to provide rigid schemes into which a child is fitted.

This clinician recalls, as if it were yesterday, a supervisory experience in which he was describing to Dr. Allen some of the enthusiastic interpretations he had been making in a series of therapeutic hours with a child. "You remind me," Dr. Allen said in his disarming way, "of the Southern Baptist preacher who stood before his congregation and said, 'When you feel that spark, water it!' " What more eloquent way could a supervisor bring to the supervisee the importance of letting change emanate from within the child.

A Decade of Self-Realization and Community Recognition

In the final decade of his life, he reached the pinnacle of his professional career. This could truly be called a decade of self-realization and community recognition. It began auspiciously with his paper, "Aggression in Relation to Emotional Development, Normal and Pathological" (1950), which he presented in a symposium which included Anna Freud and Melanie Klein at the International Congress on Mental Health held in London, England, in August, 1948. Whereas aggression had come to be an expression of a destructive instinct often equated with hostility and uncontrollable or unmanageable id impulses, Dr. Allen emphasized the positive, constructive aspect of aggression, suggesting that as such, it contained "the powerful potential for creative and responsible action contained in the 'going out' quality needed by all individuals and by all nations." He pointed out that the word "aggression" is derived from the prefix "ad," meaning "to," and the suffix "gressor," from "gradi," meaning "to walk or march"—hence, the generic meaning "going toward." And he called to our attention a significant quotation in the Oxford Dictionary, dating back to 1575, which used the word "aggression" in a positive and what he felt was a technically correct sense. "Behold I see him now aggress and enter into his own." He was justly proud that after delivering this paper, both Anna Freud and Melanie Klein told him they fully agreed with all he had said.

Beyond this, in his role as a dissenter from the classic psychoanalytic theory of aggression, he became a stimulator of a more ego-oriented psychology which began with Freud's *The Ego and The Id* (1923) and was to be further nurtured by Anna Freud's classic work, *The Ego and the Mechanisms of Defense* (1936), and Hartman's monograph, *Ego Psychology and the Problem of Adaptation* (1939). In his own growth jour-

ney toward professional self-realization, Fred Allen clarified his theoretical formulations in his two papers, "Constructive Forces Operating in the Individual" (1953) and "Horney's Conception of the Basic Conflict Applied to Child Psychiatry" (1956). At the same time, he encouraged continued emphasis on the importance of setting up standards for the training of child psychiatrists through the formation of the American Academy of Child Psychiatry and the establishment of the process of nation-wide certification in the subspecialty of child psychiatry within the framework of the American Board of Psychiatry and Neurology. In recognition of the creative part which he had in advancing the concept of training, he was selected as the first Chairman of the Committee on Certification in Child Psychiatry and Chairman of the first Committee on Child Psychiatry of the Group for the Advancement of Psychiatry. In 1950 formal recognition was accorded Fred Allen when he received the Philadelphia Award (later referred to as the Edward W. Bok Award) for "salvaging thousands of the City's children by advancing Child Psychology through educating the public and training scores of Child Psychiatrists serving all over the world." His professional stature was also recognized by his alma mater, The University of California, when he was granted an honorary Doctor of Laws degree in 1953.

It was also during this decade that he was frequently called in as a consultant to community guidance centers and child psychiatric training centers throughout the United States. On one occasion, after making a very effective contribution to one of the sticky administrative problems in a community mental hygiene clinic, the director of that clinic observed that Dr. Allen had done a masterful job. "The touchstone of his success," this director commented, "lay in the fact that Fred Allen was as much at home with the wealthy and the powerful as he was with the poor and the powerless."

All of us saw in Fred Allen a quality of gentle strength which allowed him to "aggress and enter into his own." Seldom did we see him lose his equanimity in the face of a challenge to his point of view. Perhaps the one exception occurred in the early 1950's when Dr. Philip Star presented his paper on "Triangular Therapy" before the American Association of Psychiatric Clinics for Children. The paper contained a great deal in it to suggest that concurrent collaborative therapy as practiced in the traditional child guidance clinic was a failure. Coming to the podium with obvious irritation and smoldering rage, Dr. Allen warned the group against "throwing out the bath with the baby" (*sic*).

Epilogue 1963: Child Psychiatry Comes of Age

After his retirement as Director of the Philadelphia Child Guidance Clinic in 1956, he continued to serve the community as Psychiatric Consultant to the Philadelphia Board of Education. In 1961, following a standing ovation by the members of the American Academy of Child Psychiatry, he delivered a paper which served as an epilogue to his own career in child psychiatry as well as a poetic summation of the past and the promise of child psychiatry. In this paper, "Child Psychiatry Comes of Age" (1963), he wrote:

> As we look both back and ahead, it is so important to keep in mind that parents and children, by their use of our services, have been the builders of our clinics and of Child Psychiatry. From them, we have learned how our skills can be used, sharpened and made effective. Theories have evolved—tested, enriched and discarded for new enlightenments—not through our own intellectualization, but through the refining fires of use.

In 1963 a committee from the Alumni Association of the Philadelphia Child Guidance Clinic worked with him in the publication of all his papers in the volume, *The Positive Aspects of Child Psychiatry*. All of his papers referred to in this tribute can be found in that volume.

Perhaps these words, again from his paper, "Child Psychiatry Comes of Age," best described the way he would like to be remembered:

> May we never grow complacent, the sedative of progress, but keep alive our critical judgments and utilize the value of conflict, which can provide the ore of progress if the heat generated is great enough to refine it but not so great as to destroy it.

Fred Allen generated a great deal of heat while he lived among us. Truly, he walked with the great men of our time, for he was one of them.

Acknowledgment

The author would like to acknowledge the thoughtful cooperation he received from several of his colleagues, who had been trained by Dr. Allen, in sharing with him some of the anecdotes included in this manuscript. He is particularly indebted to Miss Dorothy Hankins, Chief Social Worker of the Philadelphia Child Guidance Clinic, for making available the collected papers and correspondence of Dr. Allen, as well as for several of the anecdotes which were included in this presentation.

II. The History of Child Psychiatry in Pennsylvania[1]

By LAUREN H. SMITH, M.D.[2]

THE history of child psychiatry in Pennsylvania is filled with incidents and programs which pioneered in the developments concerned with children and youth early evident throughout the nation.

In Pennsylvania, an early endeavor appeared with the establishment of Lightner Witmer's Psychological Clinic, established in 1896 at the University of Pennsylvania. This was originated by an academic teaching psychologist, not based on a medical model, and concerned with reading and learning difficulties, aptitude testing, mental retardation and delinquency.

Other centers which early contributed to the foundations of child guidance, or child psychiatry, were the Chicago Juvenile Psychopathic Institute, founded by Dr. William Healy in 1909 (later called the Institute for Juvenile Research), and its Boston companion, the Judge Baker Foundation (now the Judge Baker Guidance Center). Both of these were largely concerned during the early years with juvenile delinquency. At the same time, social workers were employed by a number of state mental hospitals and clinics in New York and Massachusetts and were appointed to the staffs of Boston Psychopathic Hospital and the Henry Phipps Psychiatric Clinic of Johns Hopkins Hospital, to serve children as well as adults.

The entire period was also greatly influenced, of course, by the National Committee for Mental Hygiene, founded in 1909.

These early developments were solidified when the Commonwealth Fund in New York supported the formation of the Division on the Prevention of Delinquency (later, the Division on Community Clinics) of the National Committee for Mental Hygiene, with the responsibility for the formation of demonstration services or clinics which would examine and treat problem children. The first clinic was begun in 1922 at St. Louis and was followed by others at Norfolk, Virginia, and Dallas, Texas. Similar early demonstration clinics of the same organizational plan for service, but under various other financial backing, also opened at Monmouth County, New Jersey, Minneapolis and St. Paul, Minnesota, Los Angeles, California, and Cleveland, Ohio, and finally, at Philadelphia in 1925, after which the Commonwealth Fund's original program came to an end. *Child Guidance Clinics,* by George S. Stevenson and Geddes Smith, published by the Commonwealth Fund in 1934, states, "During the five-year period, child guidance clinic service in the United States had increased, partly as a result of that program, approximately fourfold. In the eight clinics permanently established as the direct result of demonstrations, the patterns of child guidance had been clarified. The focus of professional attention had shifted from delinquency and the court to the more subtle evidences of nonadjustment in the home and school. Much had been learned as to the means of linking the clinic with the community. The mutual responsibility of clinic and social agencies, in particular, had gradually been revealed, and concrete methods had been worked out to give it effect. Financial policies had

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been shaped and tempered by failures and successes. Channels through which the clinic might realize its educational opportunities had been traced. Many problems remained unsolved, but the strategy of dealing with them was reasonably clear."

Philadelphia Child Guidance Clinic

The establishment of the demonstration clinic in Philadelphia not only was significant as the last clinic to be opened in this manner, but turned out to be undoubtedly the most productive, stimulating and progressive child guidance center in the nation. This was fundamentally due to the imagination, leadership, professional proficiency, energy and dedication of its first director, Dr. Frederick H. Allen. Because of his unique personal and professional qualifications, he succeeded quickly in fusing what were real strengths in the Philadelphia area into wide community and professional support. These included a strong lay board of real community leaders, an active Mental Hygiene Committee of the Public Charities Association, the clinical support of the Institute of the Pennsylvania Hospital and the Children's Hospital, and board interrelationships with mature social agencies and social service schools. Dr. Allen was ably assisted by gifted leaders as associates and Chiefs of Service, Almeda Dawley in Social Service and Phyllis Blanchard in Psychology.

Thus, child psychiatry had its most significant emergence in Philadelphia and Pennsylvania. Soon, other facets in clinical work and education appeared. Some were direct outgrowths of the pioneer work of the All-Philadelphia Child Guidance Clinic, later known as the Philadelphia Child Guidance Clinic. Other developments were original and perhaps spontaneous, but probably nearly always originated because of the work and influence in the Philadelphia community of the already existing clinic.

Growth in Pennsylvania

From about 1930, developments in Pennsylvania were varied and numerous. The variety and number of new centers permits only an account of their founding, in chronological order as accurately as can be determined, and a few brief remarks in certain instances about their programs or specialized purposes or contributions to the field of child psychiatry (Table I).

The first residential care in child psychiatry in Pennsylvania was initiated by the Pennsylvania Hospital for Mental and Nervous Diseases, now the Institute of the Pennsylvania Hospital. In 1924 it opened a diagnostic and treatment in-patient service for emotionally disturbed pre-adolescent and younger children, who presumably had had encephalitis and who displayed on recovery an aftermath of overactive, bizarre and disturbed behavior. This was a specialized service, supported by the Commonwealth Fund, and terminated in 1935.

The next residential care unit for children was opened by the Commonwealth of Pennsylvania in an especially constructed hospital at the Allentown State Hospital in 1930–31. Admissions here included all types of psychiatric disorder or disturbed behavior in young children or adolescents. The Eastern State School and Hospital, also a unit of the Commonwealth of Pennsylvania for eastern Pennsylvania, offered out-patient services for emotionally disturbed children in 1962 and admitted patients for residential care in 1963.

What was probably the second formal child guidance clinic in Pennsylvania was opened in 1931 in Pittsburgh as the Pittsburgh Child Guidance Center. This was the only major community facility offering both a psychiatric service to children and a training program in Pittsburgh until 1952. Because of the training program and influence of this center, other clinical psychiatric facilities for children became available in the Pittsburgh community. An

TABLE I

THE FOUNDING OF CHILD PSYCHIATRY CLINICS IN PENNSYLVANIA

	Year of Opening	AAPCC Membership or Training Clinic Approved
Philadelphia Child Guidance Clinic	1925	Training 1948
Guidance Institute of Berks County	1927	Member 1948 (Charter Date)
Pittsburgh Child Guidance Center	1931	Training 1948
Lehigh Valley Guidance Clinic	1934	Member 1948
Lancaster Guidance Clinic	1937	Member 1948
Child Guidance Clinic of Harrisburg	1938	Member 1948 (Inactive)
Children's Service Center, Wyoming Valley	1941	Member 1948
Child Psychiatry Clinic, St. Christopher's Hospital	1941	Training 1958
Guidance Center of Northampton and Monroe Counties	1945	Member 1954 (Inactive)
Child Guidance Clinic, Delaware County	1947	Member 1957
Child Psychiatric and Guidance Center of Lackawanna County	1947	
The Child Study Center of Philadelphia	1948	Training 1951
Old York Road Mental Health Clinic, Abington	1949	Member 1960
Montgomery County Mental Health Clinic, Norristown	1950	Training 1967
Children's and Adolescents Unit, Philadelphia General Hospital	1950	Member 1960
Albert Einstein Medical Center	1950	
Hahnemann Medical College, Division of Child Psychiatry	1952	
Lankenau Child Guidance Clinic, Philadelphia	1954	Associate / Member 1966
Psychiatric Clinic, Children's Hospital, Pittsburgh	1956	Member 1958
Children's Unit, Eastern Pennsylvania Psychiatric Institute, Philadelphia	1956	Training 1962
South Hills Child Guidance Center, Pittsburgh	1958	Member 1961 (Closed 1963)
Jefferson Medical College and Hospital	1961	
Irving Schwartz Institute for Children and Youth, Philadelphia	1963	Associate / Member 1965

early and significant residential treatment service for children was opened at the Western Psychiatric Institute and Clinic in 1952. Another child guidance clinic was formed at the Children's Hospital, known as the Psychiatric Clinic of the Children's Hospital of Pittsburgh. It opened in 1956. Other developments in these areas included the Western Pennsylvania Diagnostic and Evaluation Center for Children, which began in 1960, and the Western State School and Hospital, a residential hospital for disturbed children, which opened in 1963. An additional child guidance center, known as the South Hills Child Guidance Center, was also opened about 1958, but it closed in 1963.

Lehigh Valley Guidance Clinic, organized in 1934 under the auspices of the Department of Welfare of Pennsylvania, immediately became a clinic under a board of citizens of the Lehigh Valley area. The first Director was Dr. Paul Holmer, on a one-day-a-week basis. Under Dr. Rachel Winlock, the present Director since 1942, it grew very slowly but finally became a full-time clinic in 1956, with a staff of 15 people. It is now supported by the Community Chests of both Allentown and Bethlehem.

What is now the Guidance Center of Northampton and Monroe Counties at Easton, Pennsylvania, operated on a one-day-a-week basis at Easton as part of the

Lehigh Valley Guidance Clinic. But in 1945 it assumed its own identity, financing and board support as a separate clinic.

The Lancaster Guidance Clinic of Lancaster, Pennsylvania, was established in 1937, when it held the unique position of being the first community psychiatric clinic in a small city. It continues to provide diagnosis and psychotherapy for emotionally-troubled children and adults. It is an accredited member of the AAPCC.

The Guidance Institute of Berks County, in Reading, Pennsylvania, was founded in 1922, as a Mental Health Clinic, one of forty Mental Health Clinics in Pennsylvania, established under the Pennsylvania Department of Welfare, Bureau of Mental Health. It was not until 1927 that it received a legal charter under the name "Mental Health Clinic." It became a charter member of the American Association of Psychiatric Clinics for Children (AAPCC) in 1948, indicating, of course, its activity in the field of child psychiatry. In 1967, it merged with the Children's Aid Society and the Family Agency in Reading to become the "Family Guidance Center."

The Children's Service Center of Wilkes-Barre, Pennsylvania, provides something a little different in the field of child psychiatry. Formerly a children's orphanage, known as the Home for Friendless Children, upon the recommendation of Dr. George Stevenson of New York, who made studies of many children's agencies in Pennsylvania, it transformed itself into a Residential Treatment Center for Children in 1941, under the late Dr. J. Franklin Robinson. The present Director is Dr. Milford E. Barnes, Jr. Children reside there while under treatment, but attend public school during the day. An outpatient treatment service is also furnished, and a day care center is now proposed.

The Southern Home for Children in Philadelphia has followed this path to some extent. Also formerly an orphanage, it has provided residential treatment care for emotionally disturbed children since 1955.

The Tri-County Guidance Center of Harrisburg, Pennsylvania, is a community clinic for both adults and children. The Director is Dr. Eugene Alexander, and it opened in 1938. Plans for the future include affiliation with the Harrisburg Comprehensive Community Mental Health Center.

Growth in the Philadelphia Area

In 1944, the Council of Social Agencies made proposals to study the needs of children in the Philadelphia area. The Board of the Seybert Foundation agreed to sponsor jointly with the Council of Social Agencies a survey of psychiatric resources and needs of children in metropolitan Philadelphia, to be made under the direction of Dr. Helen L. Witmer. The local psychiatrists consulted on this were Dr. Frederick H. Allen, Director of the Philadelphia Child Guidance Clinic, and Drs. Earl D. Bond, Lauren H. Smith and Edward A. Strecker of the Institute of the Pennsylvania Hospital. A planning committee on the survey was organized by the Council of Social Agencies to study the recommendations, and in January 1947 the Council submitted to the Seybert Foundation two specific proprosals for financial support:

1. To expand the Philadelphia Child Guidance Clinic;

2. To establish a new clinical unit at the Institute of the Pennsylvania Hospital for study and short-term treatment of children under 15 years of age.

It was decided to establish a clinic at the Institute, not to duplicate the work done at the Philadelphia Child Guidance Clinic, which then was usually more long-term, but to create a new type of consultation service and short-term treatment that could be used by parents and families and which would broaden the work then being

done with children in the Philadelphia area.

On May 13, 1947, the Seybert Foundation directors voted to accept the proposal of the Institute of the Pennsylvania Hospital for the establishment of a children's consultation service. The newly named Children's Unit was opened at the Institute on July 5, 1948, with a staff consisting of a Director, a full-time Psychiatric Social Worker (who had formerly worked with the Judge Baker Guidance Clinic in Boston), a secretary, and two full-time Fellows qualified and experienced in child psychiatry. Dr. Calvin S. Drayer opened the new clinic, serving part-time as the first Director and aiding in the search for a full-time Director.

Dr. Norman Nixon succeeded Doctor Drayer on September 1, 1949, on a full-time basis. Dr. Harry Gianakon became the next Director in 1958, and he was succeeded by Dr. Frederick Wawrose in 1963.

The Child Psychiatric Clinic of St. Christopher's Hospital has had an interesting history since its essential founding in 1941. At that time, it was part of and located at the Pediatric Clinic of Temple University Medical School. In 1952, Dr. Waldo Nelson became Professor of Pediatrics and also Medical Director of St. Christopher's Hospital, and he invited the Child Psychiatric Clinic to quarters at the hospital. The Director then was Dr. Stewart Finch, who was succeeded by Dr. Calvin Settlage as Director and Professor of Child Psychiatry in 1955. He was succeeded by Dr. John Dunn as Director of the Clinic in 1962.

The Child Guidance Clinic of Delaware County had its beginnings as a branch of the Philadelphia Child Guidance Clinic in 1947. The first administrator of the branch clinic was Miss Dorothy Hankins, psychiatric social worker staff member from the Philadelphia Clinic, who worked one day a week in the Delaware County Branch for the first two years, until July 1949, when the late Dr. Frederick D. Dudley, child psychiatrist, became administrator in 1956. From a part-time clinic with only one day a week for therapy and three days of social work time, serving only part of the county in the Philadelphia Community Chest area, it became a full-time clinic with service to the entire county in 1951, when the Chester Community Chest began to contribute to its support.

The Children's Out-patient Department and the Residential In-patient Care Unit at the Eastern Pennsylvania Psychiatric Institute opened in May 1956. This provided for eastern Pennsylvania what had earlier been made available in Pittsburgh at the Western Psychiatric Institute. Progressive programs also soon indicated the values of day care programs for disturbed children, and within two to three years greater emphasis was given to the day care program which has continued. In 1968, there are six separate day care units operated at Eastern Pennsylvania Psychiatric Institute. The in-patient service as well as large out-patient services continue.

The Children's and Adolescent Unit of the Philadelphia General Hospital opened on a part-time basis about 1950, with Dr. Robert Freed as Director. He was succeeded by Dr. A. Ferdinand Bonan in 1955, and the clinic has since functioned on a full-time basis. It is approved as a training center for child psychiatry by the American Association of Psychiatric Clinics for Children.

Abington Memorial Hospital as a general hospital has operated a psychiatric ward service and out-patient service since before 1949. It would be inaccurate to estimate when services for child psychiatry were furnished, but a child psychiatrist was formally added to the staff in 1957. What is now designated as the Old York Road Mental Health Clinic has functioned as the hospital's out-patient psychiatric clinic, providing psychiatric evaluation and treatment to both children and adults. The Children's Unit of this clinic has been headed by a pediatrician and child psychi-

atrist since 1964, and the unit has been a member of the AAPCC since 1960.

Bucks, Montgomery, Delaware, Chester and Philadelphia Counties have been furnished some diagnostic services by the Tri-County Mental Health Clinic since 1950. Within a decade, each county area developed local clinic facilities in psychiatry, and the Montgomery County Mental Health Clinic operated at Norristown, Pennsylvania, as a community out-patient psychiatric facility for both adults and children. For many reasons, including the great need for psychiatric consultation and treatment for children, the Clinic worked toward the goal of being a clinic accredited by the American Association of Psychiatric Clinics for Children. This was accomplished in 1964 when it became a member of the AAPCC; it was made an approved training clinic in 1967. The Director is Dr. Sidney I. Altman, who has been certified in both adult and child psychiatry since 1962.

The Irving Schwartz Institute for Children and Youth of Philadelphia, a unit of the Philadelphia Psychiatric Center, opened as an out-patient psychiatric facility in 1963. It furnishes a generalized diagnostic and therapeutic service for children of ages 3 to 18 and their families and also has specialized programs such as a preschool unit, a therapeutic educational program and a summer day camp. The Director is Dr. Herbert Herskovitz and the Associate Director is Irving Schulman, Ph.D.

Lankenau Child Guidance Clinic of the Lankenau Hospital opened as a part-time clinic in January 1954. The first and present Director is Dr. Kenneth Gordon. The clinic service grew rapidly, and it has functioned essentially on a full-time basis since about 1957; it has also provided training in child psychiatry for residents.

The Child Psychiatric and Guidance Center of Lackawana County at Scranton, Pennsylvania, began functioning in 1947 as an active child guidance clinic, supported 60% by state funds with the remaining budget derived from the United Fund and from a board of citizens. As is characteristic of so many of our smaller clinics, it has a full-time psychiatrist, three social workers and two full-time psychologists. It has already formally affiliated with the new local mental health center to provide its specialized services as part of the center.

The Albert Einstein Medical Center undertook its first psychiatric activity for children at its Southern Division (Mount Sinai Hospital) about 1950, when it organized a child psychiatric clinic, with some service for children and some training in the techniques of treating children. In 1955, Dr. Harold Kolansky organized a section of child psychiatry, primarily based at the Northern Division of Albert Einstein Medical Center, as a part of the hospital's Department of Psychiatry, representing a center-wide commitment to service, training and research. From 1963, it has operated as a full-time teaching department of child psychiatry with a training program in child psychiatry approved by the American Board of Psychiatry and Neurology.

Jefferson Medical College and Hospital has furnished part-time diagnostic and treatment service for children for many years but was relatively unstructured as a clinic until about 1961, when a specialized clinic for learning problems was opened. A full-time children's psychiatric clinic was activated about 1965 and operates as part of the Department for Child Psychiatry.

Hahnemann Medical College and Hospital has conducted an active training program in child psychiatry since 1952, although furnishing clinical service for children and their families for some time previous to that date. The training program includes diagnostic and treatment services for children from infancy to age 17 and is approved by the National Institute of Mental Health and the Committee on Certification in Child Psychiatry of the American Board of Psychiatry and Neurol-

ogy. This section on child psychiatry operates a little differently from the usual child guidance clinic, because of its incorporation in the interdepartmental atmosphere of a medical college and a general hospital of 550 beds. The Director is Dr. Herman S. Belmont, Professor and Head of the Section on Child Psychiatry.

Too extensive to document accurately here, because of its highly specialized aspect, but yet contributing to child psychiatry not only in Pennsylvania but throughout the nation, is the work of the Elwyn School, of the Devereux Schools and of the Woods School. For the sake of completion, the educational and psychological work done in other private schools and colleges should also be mentioned.

To those clinics or centers not included here which may be furnishing various services in child psychiatry, the author apologizes. Newly-formed centers or part-time services not usually associated with teaching institutions, hospitals or clinics, or not members of the AAPCC may have been overlooked, especially if insufficient data or communication was not readily available.

A more intensive study in depth to include all types of services contributing to the field of child psychiatry would include other agencies, institutions and services. In the Philadelphia area these might include the following:

The American Federation of Labor Medical Center
The Board of Education, School District of Philadelphia
The Catholic Children's Bureau
The Child Study Institute of Bryn Mawr College
Division of Mental Health, Department of Public Health
Association for Jewish Children.

In general, these are not operated in the form of model or characteristic child guidance clinics because of specialized in-take or clinical services. Such a list might also be made for other areas of Pennsylvania, especially the Pittsburgh area.

Finally, then, we have accounted for 24 centers of child psychiatry in Pennsylvania, 23 still in existence, all born since the significant beginnings of the 1920's.

What of the Future?

The history of child psychiatry in Pennsylvania is a worthy one, in originality, in leadership, in source; it is better perhaps than in most or many areas of the fifty states. There is a movement toward better relationships with school systems, with educators in general and with other health agencies and medical schools. Much more is needed, however. Service is still inadequate because of lack of financing of programs and lack of personnel; also, existing child psychiatric services are sometimes isolated. Many research programs are needed, as well as service, to determine the quality and effectiveness of current projects and to develop new approaches for the problems of today. Much greater collaboration with and penetration of primary school systems should develop soon. Much broader programs for the mentally retarded and for problem cases of specialized social agencies should be widely available. The new comprehensive mental health services may open new areas for the development of child psychiatry or may purchase time and service for existing clinical units on an affiliated and collaborative basis. Let us hope that every opportunity to create growth and progress may be universally supported.

III. The History of Adolescent Psychiatry in Philadelphia[1]

By PHILIP J. ESCOLL, M.D.[2]

I AM honored to be included in this tribute to Dr. Allen tonight. It is also a pleasure, and a tranquilizing experience, to be asked to speak on history tonight. Ordinarily, the topics are likely to be hippies, the new morality, youth unrest and drugs. Perhaps I may even escape without having to define adolescence!

I think it is an expression of the recognition of the historical development and growth of adolescent psychiatry that a presentation should be given on this topic. After all, it has only been in the last five years that we have come to use the term "Adolescent Psychiatry" with frequency, and, as my remarks will illustrate, for a long time adolescent psychiatry was considered to be the stepchild of psychiatry.

Development of Child Guidance Clinics and Juvenile Delinquency

It is interesting as we look back over the years in Philadelphia, as well as nationally, to see that child psychiatry in many respects had its beginning in the treatment of adolescents. Then, adolescents, particularly the older ones, were, in a sense, abandoned for almost thirty years, that is, from the late 1920's to the late 1950's or early sixties.

In 1896, Lightner Witmer, who coined the term "clinical psychology," opened the first psychological clinic to use remedial methods to treat defective children. This was in relationship to the University of Pennsylvania. Dr. William Healy in 1909 founded the Juvenile Psychopathic Institute in Chicago. Healy studied the work being done on delinquency and found only two American clinics devoted to the treatment of delinquents, both in this area. One was Witmer's Clinic at the University of Pennsylvania and the other was Goddard's at Vineland, New Jersey. Healy wrote a textbook, *The Individual Delinquent,* in which he pointed out that delinquency was not due to defective genes or to degeneracy. This was followed by a study by Bernard Glueck of inmates at Sing Sing which disclosed similar findings. Clarence Darrow, in 1922, in his volume, *Crime, Its Causes and Treatment,* supported a basic tenet of the mental hygiene movement, namely, that punishment was not a cure for delinquency. Dr. Fred Allen's paper in 1925 on delinquency was also an important contribution.

In 1922, the National Committee for Mental Hygiene, financed by the Commonwealth Fund, initiated a five-year program for fellowships at child guidance centers; it also advocated establishing liaison between courts and psychiatric teams as well as the idea of schools having consultant psychiatrists.

The recognition that a delinquent child or an adolescent delinquent is not an individual who is innately bad, but that anti-social behavior may represent a behavioral manifestation of an underlying emotional problem, led to attempts to treat these individuals directly. It was out of this recognition that hope was born for the treatment of delinquents, and this en-

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couraged the formation of child guidance clinics and the work of psychiatrists with delinquents both in clinics and in courts.

An additional stimulating force for the treatment of such individuals was the growing recognition of psychoanalytic concepts. Psychoanalysis was the first discipline to comprehensively focus on the emotional development of the individual personality and its deviations. Freud in his three essays on the history of sexuality in 1905 had encompassed adolescents in his description of personality development. He pointed out that from the age of 12 through adolescence there was a revival of the oedipal conflict of earlier years.

Thus, a growing number of individuals equipped with a growing body of knowledge came to consider deviant behavior in youth as a phenomenon requiring treatment, and the need for facilities to bring about such treatment was apparent. The growth of social work and psychology in the early twenties was part of this movement nationally and locally.

Institutional Facilities for Treatment of Adolescents

One could hardly discuss the treatment of adolescents without mentioning the work and contributions of August Aichorn in the 1920's and subsequently. Aichorn was a Viennese school teacher who, through reading, became influenced by Freud and who then studied at the Vienna Psychoanalytic Clinic. He established two institutions for the treatment of delinquents and he wrote thoughtfully describing his concepts, his most famous work of course being *Wayward Youth.*

Some of his ideas remain worthwhile to this very day. He advocated for one group of adolescents the need for a relationship with a trusting adult. He pointed out that in these cases identification with a good ego ideal was necessary. A second group needed increased respect for an authority figure. He pointed out that one needed to convert the delinquents, some of whom had little conscious guilt, into individuals whose symptoms were neurotic so that they could be treated.

I cite Aichorn's work because he inspired the formation of many residential treatment centers for delinquents. It is interesting that we are again currently returning to the concept of residential treatment centers for adolescents, and many of the youngsters now being admitted for treatment have behavioral disorders even though their backgrounds may differ considerably from the delinquents treated back in the 1920's.

Philadelphia Facilities

What was happening in Philadelphia during this period? The child guidance clinics were established and they did treat adolescents generally up through the age of 16 or 17 although there was no formal focus on adolescents as a group requiring skills and techniques of treatment different from those for younger children. It is interesting to note, as one reviews the literature from this period and from the period through the 1930's and 1940's, how few specific references there are to adolescents and to their treatment. Even in Leo Kanner's standard text of child psychiatry first published in 1935 there are very few specific references to adolescents and no special chapter devoted to them. The same obtains in Dr. Allen's books of this era, although we know he and others at his clinic were very much interested in adolescents and their treatment.

Of course adolescents were being treated in hospital settings. Both the Institute of the Pennsylvania Hospital, with its Department of Mental and Nervous Diseases at 44th and Market, and Friends Hospital were treating adolescent in-patients. This was a necessity in a sense because many of the patients treated were schizophrenics and, of course, schizophrenia is a process which often begins in the adolescent

years. However, again the focus was not so much on these patients as adolescents undergoing the turmoil and changes of adolescence but rather as schizophrenics.

There was a very interesting residential center established at the West Philadelphia division of the Pennsylvania Hospital under the supervision of Drs. Earl D. Bond and Kenneth E. Appel and I know Dr. Lauren H. Smith was subsequently interested in this work also. It involved the treatment of post-encephalitic children who had behavioral disturbances and in 1924 classes and a residential center called the Franklin School were established for their needs. Sixty-two children under 13 years of age were treated in this setting between 1924 and 1930. Although this was a center for children and not adolescents it is important in that it was something of a prototype for some of the adolescent units devoted to behavioral problems which we have today.

No Man's Land

As the field of psychiatry developed in the Philadelphia area and elsewhere, child psychiatric clinics increased in scope and number. The younger adolescents were included but the older adolescent, that is, those in the age group approximately 16 through 18 to 20, were left out. It is this group that is often referred to as stepchildren in a no man's land. Why this avoidance? This question is difficult to respond to and I don't know that I have the answer to it. One can, however, consider many possible factors. First, the adolescent population in the 1930's, and 1940's was not of the magnitude that it is today. Second, the theoretical conception, heavily influenced I think by the popular conception, was that troubled adolescents were merely going through a phase of turbulent development which would be overcome. Our recent studies and understanding show that, while adolescence can be a period of considerable turmoil, it is a grave error to underestimate the depth of pathology which can develop during this time and which may linger into adulthood if untreated. Thirdly, there was not the focus on the adolescent sub-culture that there is today, either socially or commercially. Today, with the increasing youthful population, advertising and a commercial focus on youth has furthered the development of a sub-culture which has brought our attention to this age group. Finally, our psychiatric and psychoanalytic understanding have developed since the period I have been describing. It was thought that adolescents were so involved in their own internal struggle that they had insufficient libido available for developing a relationship with the therapist. This was a concept advanced by Anna Freud.

Many psychiatrists found it difficult to work with the adolescent patient because of the anxiety to which the therapists themselves might be subjected in view of the strong anxiety and emotional self-centeredness of the adolescent and the direct confrontation necessary in therapy. Anna Freud as recently as 1958 said that the analytic treatment of adolescents is a hazardous venture from beginning to end. We no longer feel, however, that this venture is insuperable, particularly as we have learned more about ego functioning, coping responses and adaptive maneuvers.

Colleges and Schools

Today, there is much concern and attention to youth unrest in our schools and colleges and an increasing feeling that to make significant inroads on emotional problems one needs to begin early, and, to do this, one needs to work through the schools and universities. This is a movement that has many antecedents because the Commonwealth Fund in the 1920's suggested work with the schools.

An interesting venture developed at Yale in 1926 and 1927 in which a group of people interested in mental hygiene met

with a small group of freshman every night in the dormitory. These fireside chats considered topics which might be discussed today, for example, sex and nervous breakdowns. (There is no reference to discussion of drugs!)

A division within the Student Health Department devoting itself to the psychiatric needs of students was established at the University of Pennsylvania in 1957, a consultation service with one psychiatrist having been organized in 1953. Over the years, other schools in the area followed suit, although Philadelphia area colleges still have much to do in this realm. In the 1950's several of the private schools in the area asked for psychiatric consultants. Dr. William Peltz served as consultant to the Lawrenceville and the Hill Schools, as he still does. The Baldwin School established a consultation service just last year so that these developments are continuing. Dr. Fred Allen and Dr. Phyllis Schafer served as consultants for the Philadelphia School System. The Community Mental Health Centers have as one of their major objectives consultation services to the schools.

The Last Decade

The need for attention to adolescents has developed tremendously in the last ten years both in this area and elsewhere. As adolescents have swarmed into the headlines, into our offices and into our hospitals, and as we have struggled to learn something about them and to learn how to help them, I think we have finally come to recognize that adolescence itself is neither a phase to get out of as soon as possible nor a social disease but is rather a significant period in the total personality development of the individual. During this period the individual needs to come to a firm sense of self and to be able to look ahead to his future as an adult.

At the American Psychiatric Association's meeting in 1960, many psychiatrists interested in working with adolescents throughout the country got together and considered the establishment of local societies to serve as forums for understanding adolescent problems. Such a group had been formed in New York in 1958 and proved to be very active and worthwhile. Dr. Douglas Cownie, Director of The Psychiatric Division of Student Health at the University of Pennsylvania, and I attended this meeting. In 1962, we sent a questionnaire to thirty psychiatrists in the Philadelphia area whom we felt had an interest in adolescents. We received twenty favorable responses about the possibility of establishing an adolescent society and as word of mouth spread it was astonishing to me to hear of the number of individuals, both child psychiatrists and adult psychiatrists, who were very actively treating individuals under 21 years of age.

In the fall of 1962 we held our first organizational meeting and the Philadelphia Society for Adolescent Psychiatry was launched. It has had a very successful development and now has over eighty members. It meets three times yearly and has formal lectures as well as workshops devoted to the study of adolescent problems. Such groups have been formed in other cities as well, including Los Angeles and Chicago. In 1967 these groups agreed to form a confederation of the local adolescent societies, and the American Society for Adolescent Psychiatry was founded. This society met again at the APA Meeting in May 1968.

Present Developments

There has been rapid growth in the need for treatment facilities for adolescents, both in-patient and out-patient, evidenced by all available statistics. According to figures from the National Institute of Mental Health, the out-patient psychiatric clinics in the United States served more persons in the 10- to 19-year age group than in any other decade of life. One-fourth of all clinic patients in 1963 were

adolescents. The in-patient population figures are even more striking, because in that group there has been a 10 percent decrease in total hospitalization population, but the number of patients from 10 to 14 years was 325% higher in 1963 than in 1950. These statistics do not include the large number of youths in private psychiatric hospitals and in special schools for which statistics are not available.

If the present trend continues, the National Institute of Mental Health predicts that there will be an increase of almost 90 percent in the rate in which young people are institutionalized in state and county mental hospitals during the next decade. A widely circulated figure which most of you probably know is that by 1970 over 50% of the total population in this country will be 25 years of age and under.

With the increase in the overall adolescent population, there has been an overall increase in adolescent emotional disorders. The disorder that is increasingly brought to our attention has to do with the youth who is somewhat depressed, somewhat detached from society, unsure of his direction in career and often involved in some behavioral disturbance such as missing school or difficulty in getting along with his parents or with his peer group. These individuals seem to require not only individual treatment but work in groups and it is to this end that separate facilities have been established in this city for them. We have a precedent in this state in that many, many years ago Dr. Franklin Robinson at his Youth Center in Wilkes-Barre admitted and treated adolescent patients.

In 1962, we established a clinic for the treatment of older adolescents, that is, in the age group 16–19, at the University of Pennsylvania. I think this was an important development, because it served the age group of adolescents who had often been forgotten in the past, providing treatment for them and also serving as a facility for training residents to work with such individuals. Since 1962, while there have not been many adolescent out-patient clinics established, there have been several adolescent in-patient hospital units established. Norristown State Hospital has established such a unit within the last few years. Philadelphia Psychiatric Center has currently been developing such a program. The Institute of the Pennsylvania Hospital two years ago established a separate floor of 24 beds for the treatment of adolescents.

Such adolescent units are complicated facilities requiring services of considerable personnel; not only nurses and aides are needed to work actively with very active youngsters but also recreational therapists and school teachers are required. These units have the advantage of utilizing the disturbed behavior of the adolescents for therapeutic understanding both in the group milieu and in individual work. Family therapy and group therapy, as well as a variety of other group processes, are techniques that have been used and that will further develop, I am convinced, in the future.

Conclusion

Although adolescents, particularly the older ones, have been forgotten for many years, we can hardly make this claim today. The present attention to this age group is overwhelming. Sometimes, as I struggle with adolescent patients today and as I feel swamped by the volume of work being done in this field and the writings on it in the lay press as well as the medical journals, I wish this were a forgotten group once again. But I don't think this will be the case. I feel that there will be an increasing number of adolescent in-patient and out-patient facilities and interested therapists. I am confident that Philadelphia will follow in the tradition of Witmer and Fred Allen and continue its pioneering scientific work in this field.

Transactions of the Philadelphia Neurological Society

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PROGRAMS 1967–68*

OCTOBER 6, 1967

Concepts of the Etiology and Pathogenesis of Multiple Sclerosis. MURRAY B. BORNSTEIN, M.D.

Newer Aids in the Diagnosis of Multiple Sclerosis. DONALD H. SILBERBERG, M.D.

Treatment of Acute and Chronic Phases of Multiple Sclerosis. GUNTER HAASE, M.D.

Concepts of the Etiology and Pathogenesis of Multiple Sclerosis.

MURRAY B. BORNSTEIN, M.D.

Cultures of mammalian nerve tissue are serving as a model system for observations on the natural course and experimental evaluation of pathogenetic mechanisms in multiple sclerosis (MS) and experimental allergic encephalomyelitis (EAE). Samples of serum obtained during the active phase of these demyelinative disorders produce a characteristic and specific pattern of demyelination in cultures. The active factors in EAE serum have been demonstrated to be antibodies. Remyelination occurs in mammalian CNS tissue which has been removed from the influence of EAE or MS serum. Electrophysiological examinations also reveal a characteristic alteration in bioelectric functions so that interneuronal transmission is blocked within minutes after the tissues' exposure to EAE or MS serum. These factors also require complement for their action. Finally, electron microscopic examinations show alterations in the ultrastructural characteristics of the synapse. These changes are reversible. These findings were discussed in terms of the clinical aspects of multiple sclerosis.

Newer Aids in the Diagnosis of Multiple Sclerosis.

DONALD H. SILBERBERG, M.D.

Clinical advances include the use of more sensitive methods of detecting central scotomas such as testing color vision and determining the critical flicker fusion threshold. Awareness of increased incidence of uveitis, retinal perivenous infiltrates and trigeminal neuralgia have

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facilitated the diagnosis in some patients. Approximately 35% of multiple sclerosis patients have elevated cerebrospinal fluid gamma globulin expressed as a percent of total protein. An additional 15% have an elevated ratio of CSF gamma globulin/serum gamma globulin or of CSF gamma globulin/CSF beta globulin. These findings, coupled with normal serum electrophoresis and negative serology, indicate multiple sclerosis.

Other experimental procedures involving the effect of MS serum on CNS tissue cultures will hopefully develop into more specific tests.

Treatment of Acute and Chronic Phases of Multiple Sclerosis.

GUNTER HAASE, M.D.

The natural evolution of multiple sclerosis, with frequent relapses and remissions, makes the evaluation of the effectiveness of any therapeutic regimen very difficult.

At present no therapeutic measure is known to affect the fundamental disease process. There is evidence that short-term treatment with corticotrophin in high dosage is beneficial in acute relapses of multiple sclerosis, although the disability of patients so treated will be similar to that of untreated patients six months after cessation of therapy. Claims that corticotrophin, administered on a long-term basis, will affect the disease process have not been substantiated.

Symptomatic treatment, aimed at reducing spasticity, bladder and bowel dysfunction, pain and emotional disorder, is an important part of the management of patients with multiple sclerosis, as is physical therapy. Efforts must be made to retrain and rehabilitate the patient within the limits determined by his disease.

NOVEMBER 3, 1967

The Kleine-Levin Syndrome: A Case with Unusual EEG Findings. CAPTAIN LEONARD N. GREEN, M.C. AND CAPTAIN ROGER Q. CRACCO, M.C.

Transitory Psychotic Behavior: A Complication Following Operation on Tumors Involving the Cerebello-Pontine Angle. MICHAEL SCOTT, M.D.

Case of Progressive Akinetic Mutism in Cerebellar Hemangioblastoma with Obstructive Hydrocephalus. MATTHEW T. MOORE, M.D.

Redundant Nerve Roots as a Cause for Spinal Canal Block. LUIS SCHUTE, M.D.

Spinal Subarachnoid Hemorrhage, Following Mild Injury in Two Patients with Altered Prothrombin Times, Producing Cord Compression. WILLIAM F. BOUZARTH, M.D. AND PAUL GUTTERMAN, M.D.

The Kleine-Levin Syndrome: A Case with Unusual EEG Findings.

CAPTAIN LEONARD N. GREEN, M.C.
CAPTAIN ROGER Q. CRACCO, M.C.

This is a case report of an adolescent boy with periodic attacks of hypersomnia and bulemia alternating with normal behavior. Appropriate studies excluded neoplastic, inflammatory, traumatic and metabolic disorders. For the first time marked EEG abnormalities associated with the clinical attacks of hypersomnia have been found in this syndrome. These findings consist of a predominance of prolonged runs and bursts of high-voltage delta activity, complete absence of sleep spindles, and intermittent monorhythmic frontal delta waves during the fading phase of the illness. In the authors' opinion the clinical findings and the EEG abnormalities in this case support the thesis that the pathophysiology resides in thalamic or hypothalamic nuclei.

Transitory Psychotic Behavior: A Complication Following Operation on Tumors Involving the Cerebello-Pontine Angle.

MICHAEL SCOTT, M.D.

This complication was noted in 6 of 46 patients without previous psychosis operated by the author for tumors of the cerebello-pontine angle (41 acoustic neurinomas, 4 meningiomas, and 1 epidermoid). The psychotic episodes usually occurred during the first week after surgery and cleared within one week. The abnormal behavior was delusions of persecution, poisoning and hallucinations. Three patients had a systemic infection or meningeal irritation possibly modified by antibiotics. Their blood and spinal fluid cultures were negative. Three patients had no evidence of infection or hemorrhage.

A questionnaire concerning this problem was sent to 125 neurosurgeons and 103 replied. Thirty-seven percent had observed transitory psychotic episodes following angle tumor surgery. None attributed the complication to infec-

tion. The questionnaire data suggested psychotic symptoms occurred in at least 7% of patients after angle tumor surgery. However, one neurosurgeon, who reported having operated over 300 cases of cerebello-pontine angle tumor, stated that he had not encountered this problem.

Case of Progressive Akinetic Mutism Resulting from Cerebellar Hemangioblastoma with Obstructive Hydrocephalus.

MATTHEW T. MOORE, M.D.

A 68-year-old white widowed male had a six-month history of progressive difficulty in walking, apathy, and disinclination to talk or initiate activity. These symptoms were attributed to the recent death of his wife. Initial examination disclosed a dull, phlegmatic male with an expressionless facies who, nonetheless, was properly oriented in all spheres. Detailed neurological examination presented no overt abnormal signs other than a very bizarre incoordinate gait. Cerebral angiography, pneumoencephalography and combined air opaque media ventriculography revealed a right cerebellar tumor. Suboccipital craniectomy disclosed a right cerebellar cystic hemangioblastoma which was removed. Following operation there was progressive mental obtundity with only primitive responses, ending in a form of dementia and akinetic mutism. A ventriculo-atrial shunt performed one month after suboccipital craniectomy provided rapid restoration of speech, lucidity and motor function. One year after operation the patient is ambulatory, shows marked improvement in speech, mentality and affective reactions.

Redundant Nerve Roots as a Cause for Spinal Canal Block.

LUIS SCHUTE, M.D.

This presentation is a case report on a 47-year-old white male who has a history of an acute onset of back pain treated locally with traction and bedrest. Subsequent to this, a myelogram was attempted and was unsuccessful, and surgery was performed for a reported herniated nucleus pulposus. No defect was found at the time of surgery, and the patient presented later on with a footdrop on the left side, paresthesias and dysesthesias.

On admission, a repeat myelogram showed a complete block at the L-3 interspace. Large tortuous channels were seen in the myelogram and these were interpreted as probably blood vessels. At surgery, a complete laminectomy was performed and no evidence of extradural masses was found, but on opening the dura three large nerve roots measuring 12 cm. in length, over the normal length, herniated forcefully. The possible etiological explanations were considered, including those of a hypertrophic interstitial neuropathy of Dejerine and Sottas.

DECEMBER 8, 1967

The Problems Confronting the Cardiac Surgeon and Methods to Forestall Nervous System Morbidity. FREDERICK O. BOWMAN, M.D.

Clinical and Statistical Aspects from the Point of View of the Cardiologist and Neurologist. HARRY GOLDBERG, M.D. AND ARNOLD BANK, M.D.

Electroencephalographic and Pathological Correlates. DANIEL SILVERMAN, M.D. AND RICHARD G. BERRY, M.D.

The Problems Confronting the Cardiac Surgeon and Methods to Forestall Nervous System Morbidity.

FREDERICK O. BOWMAN, M.D.

Cardiac surgery affects the entire circulation and thus all organ systems within the body. In addition, an artifical means of circulation and oxygen-carbon dioxide exchange must be employed during open heart surgery which may have adverse effects upon the nervous system. Aside from the obvious complications of hypotension and hypoxia, the surgeon must be primarily concerned with prevention of emboli, a major source being entrapment of air within the heart. Calcific particles may embolize if left behind following repair or replacement of a calcified valve. Thrombi often reside within the damaged heart and may be dislodged, or new thrombi may form at the site of incisions or artifical valves. Fat emboli, tissue particles, and silicone emboli have been implicated.

At the Columbia-Presbyterian Medical Center from January 1 to December 31, 1966, 177 open heart operations were performed. Sixteen patients died before any assessment of their post-operative neurological status could be achieved. Of the 161 patients surviving, there

were 13 cases of gross neurological abnormality, an incidence of 8%. Four of the 13 complications were classed as serious, 2 of these patients died and one suffered serious residual defects. Five complications were felt to be embolic in origin, one from anoxia during a cardiopulmonary bypass, two from anoxia following post-operative complications, four were of unknown etiology, and one post-operative neurological problem was thought to be a residual of a pre-operative cerebral vascular accident.

Clinical and Statistical Aspects from the Point of View of the Cardiologist and Neurologist.

Arnold A. Bank, M.D., N. V. Srinivasan, M.D. and Harry Goldberg, M.D.

A retrospective study of the neurological complications of open heart surgery performed at two hospitals with the same medical and surgical teams was made. A total of 708 cases operated on between 1961 through 1966 were available for review. Four hundred ninety-four patients with acquired valvular disease experienced 35 cerebral complications (7.0%), and 214 with congenital heart disease had 20 cerebral complications (9.3%). Neurological complications occurred in 7.8% of the entire group and 45 deaths due to central nervous system disease occurred in 2.5%.

Those patients with pre-operative neurological injury (invariably related to the underlying cardiac problem) had a complication rate of 28% with an operative cerebral mortality of 2.1%. Ninety-six percent of the patients with pre-operative neurological disease had acquired heart disease. Technical operative factors including cardiac bypass time, arrhythmias, unexpected cardiac arrest, as well as the presence of valvular calcification and intracardiac clots, influenced mortality and morbidity.

The cerebral complications most often were secondary to embolism, anoxic encephalopathy, a combination of these and, to a lesser extent, accentuation of pre-existing deficit, seizures and late-occurring arrhythmias.

Electroencephalographic and Pathological Correlates.

Daniel Silverman, M.D. and Richard G. Berry, M.D.

The literature on electroencephalography in open-heart surgery was reviewed and its role assayed in three areas: pre-operative findings, operative monitoring and post-operative findings. The authors' experience with 60 patients, 53 of whom had pre-operative EEGs, was included. The pre-operative EEG provided a useful baseline study. In congenital cardiac defects approximately 40% had abnormal EEGs, a phenomenon suggesting that insufficient cerebral blood flow may interfere with normal electrophysiologic maturation. In acquired cardiac disease, while most pre-operative EEGs were normal, abnormalities were seen chiefly in cases where there had been cerebral insults or where there was chronic heart failure. The course of EEG changes during operation was described and the value of the EEG as a monitor of the status of the metabolism of the brain during operation stressed. Current single channel monitoring was incapable of picking up possible focal complications during surgery. Baseline studies assumed greater importance when there were suspected cerebral complications and the post-operative EEG could be compared to the pre-operative one. Focal disturbances, chiefly the results of emboli from thrombi, calcium, air, sponge material, etc., produced focal changes in the EEG: focal attenuation, slowing, and spiking, the latter usually when seizure phenomena were present. General disturbances were seen after edema, metabolic derangement, anoxia, hemorrhages or cardiac arrest. Examples of cases of emboli, multiple small hemorrhages, edema, cardiac arrest and carbon dioxide narcosis were given. It was concluded that the EEG is a valuable adjunct to the diagnosis of cerebral complications of the open-heart surgery patient.

FEBRUARY 2, 1968

Experimental Pathogenesis of Central Nervous System Neoplasms. Harry M. Zimmerman, M.D.

Chemotherapy of Gliomas. Ayub Ommaya, M.D.

Present Treatment of Intracranial Gliomas. Philip D. Gordy, M.D.

Experimental Pathogenesis of Central Nervous System Neoplasms.

Harry M. Zimmerman, M.D.

It has long been established that some carcino-

genic hydrocarbons such as methyocholanthrene, dibenzanthracene and benzpyrene, when implanted into the brains of inbred strains of mice, result in the production of brain tumors of the glioma variety. The type of glioma produced depends almost entirely on the site of carcinogen implantation, and the greatest overall incidence of tumors in any animal strain induced by this means falls just short of 50%. Evidence indicates that in the process of tumorigenesis there is phagocytosis of the crystalline carcinogen and that tumors develop only if such phagocytosis occurs. Electron microscopy now discloses that in the precancerous stage of the tissue response to the carcinogen, an interaction occurs between the phagocytosed chemical and the endoplasmic reticulum of the reactive cells. There then develop within the cellular cytoplasm numerous long, hollow, filamentous rods with double walls.

These rods, when sectioned transversely, have a diameter of about 77 mμ and the appearance of virus particles. These particles are soluble with RNAase but not with DNAase; they are not seen extracellularly or intranuclearly, although an occasional particle is found between the two membranes of a nucleus. They are not found at all within tumor cells. These virions, when injected subcutaneously in mice, produce fibrosarcomas.

Chemotherapy of Gliomas.

Ayub K. Ommaya, m.d.

The failure of conventional therapeutic efforts to significantly alter the devastating course of malignant gliomas of the nervous system has stimulated the development of newer approaches. The role of chemotherapy was reviewed with particular reference to our preliminary experiences with techniques aimed at bypassing the blood-brain barrier. The introduction of a chronically implanted subcutaneous cerebrospinal fluid reservoir has facilitated such intrathecal therapy and the results in our first series of patients with glioblastoma were presented. Cytotoxic drugs under evaluation by this technique include methotroxate and 8-azaguanine, the latter being the current drug of choice for glioblastoma. The case histories of two patients surviving over three years and showing no evidence of a tumor after chemotherapy were reported.

The major disadvantages of optimal chemotherapy were stressed and a plea made for pursuing other avenues of rational treatment such as may be developed from a re-examination of the Warburg theory of the primary cause of cancer.

MARCH 1, 1968

Current Concepts in Learning Theory. Eliot Stellar, ph.d.

Diagnostic Problems. Jules C. Abrams, ph.d.

Methods of Treatment. Milton Brutten, ph.d.

Current Concepts in Learning Theory.

Eliot Stellar, ph.d.

In the laboratory, highly refined methods have been developed for the study of learning in animals and man. These investigations have yielded instructive "laws of learning" and powerful methods for the manipulation of normal and abnormal behavior.

Efforts to evaluate deficits in learning and memory in the experimentally brain-damaged animal have shown that it is easy to confuse changes in attention, perception, motivation, and motor capacities with changes in learning and memory. Similarly, the recent efforts to link learning and memory to a mechanism of encoding information in macromolecules has proven equally elusive in the hands of most investigators, in part because of this very same confusion with performance variables.

While it seems easy to do a bad experiment in this field, good experiments have nevertheless been done with both the lesion method and the biochemical approach. It is most instructive to see the powerful compensation for severe brain injury that can be produced by basic training methods in the laboratory, and this approach offers much promise for clinical application in the case of the brain-damaged child.

Diagnostic Problems.

Jules C. Abrams, ph.d.

The major purposes of the evaluation are to determine the existence and severity of the learning disorder, the classification of the learning disorder, specific strengths and weaknesses, and the therapeutic steps indicated to amelio-

rate the condition. In classifying learning disorders, one may consider disturbances in the organic substratum of the ego—the central nervous system; the maturational and developmental disturbances, situational disturbances, and neurotic learning disorders. The history provides the contextual setting for the adequate interpretation of psychological and educational test findings. Such areas as the pre-, peri- and postnatal record, the medical record, the family history, the maturational and developmental history, the school history, and social and emotional adjustment are investigated thoroughly. Psychological test findings include a comprehensive evaluation of both verbal and nonverbal intelligence, the assessment of any discrepancy between functioning and potential capacity, and quantitative and qualitative indicators of specific assets and liabilities. Particular attention is paid to the perceptual and conceptual functioning of the child, his ability to regulate and control his impulses, and his basic concept of self. Educational assessment includes a detailed evaluation of all aspects of the language arts (experience, listening, speaking, reading and writing), as well as the ability of the child to handle numerical concepts. Visual, auditory and neurological examinations are done where indicated.

APRIL 5, 1968

Washington, D.C.

Severe Occult Juvenile Myasthenia Gravis Responsive to Long-Term Corticosteroids. Robert C. Griggs, M.D., and Dale E. McFarlin, M.D.

Listeriosis of the Central Nervous System. Harold S. Stevens, M.D.

Lumbar Discography: A Myelographic Correlation. John L. Fox, M.D.

Surgical Excision of Spinal Cord Arteriovenous Malformations. T. Dela Cruz, M.D., and Alfred J. Luessenhop, M.D.

The Value of Cerebrospinal Fluid Glycoprotein Levels in the Diagnosis of Primary Brain Tumor. J. C. Houck, Ph.D., H. McBride, B.A., and D. O'Doherty, M.D.

Listeriosis of the Central Nervous System

Harold S. Stevens, M.D.

Four cases of Listeria monocytogenes meningo-encephalitis in young infants were presented. The organisms were identified by bacteriological means in each case and pathogenicity of the organism for animals was demonstrated in the two instances in which the procedure was carried out. Two of the infants died and autopsy examination revealed marked destruction of the central nervous system characteristic of this organism. These two patients received chloromycetin only. One was critically ill on admission and survived only a few hours. Treatment in the second infant was delayed because the diagnosis was thought to be mental retardation. The infant who recovered but was left with hydrocephalus received sulfadiazine in addition to chloromycetin. The infant who survived without any residua was treated with penicillin and sulfadiazine in addition to chloromycetin.

Listeriosis is a disease of animals as well as of humans. Although it can strike any age, the newborn and very young infants comprise the largest group. Since the disease responds to antibiotics, awareness of the problem is all-important.

Lumbar Discography: A Myelographic Correlation.

John L. Fox, M.D.

Twenty-six cases which have undergone both lumbar myelography and discography for the study of symptomatic disc pathology were presented. The marked discrepancy in the localization value between myelography and discography in this selected series was demonstrated. The disc was considered pathologic if, during discography, the disc accepted over 1.0 to 1.5 cc. of contrast material, injection reproduced the patient's pain, and the x-ray film revealed an abnormal disc. Findings were confirmed at surgery.

The myelographic defect localized all the symptomatic discographic defects in 45% of the 26 cases and in 49% of 37 symptomatic discs. A 54% case incidence and a 49% disc incidence of false negative myelograms occurred. In the 14 cases with one symptomatic disc there was an incidence of 29% false positive myelograms. The overall case incidence of false positive myelograms was 19%.

The therapeutic aspect of lumbar discography also was emphasized. The injection of methylprednisolene acetate (Depo-Medrol®) into the symptomatic disc was frequently valuable in effecting relief of symptoms.

The Value of Cerebrospinal Fluid Glycoprotein Levels in the Diagnosis of Primary Brain Tumor.

John C. Houck, PH.D.
Herbert J. McBride, B.A.
Desmond O'Doherty, M.D.

A wide variety of neurological diseases was studied with respect to the concentration of ratios of glycoprotein-derived fucose and hexose in the CSF. The ratios of fucose to hexose in the CSF glycoproteins in patients with various neurological diseases were not significantly altered from that of the normal controls. In the CSF of patients with primary brain tumors there was found an increased ratio of fucose to hexose, a finding of possible diagnostic significance. This increased (F/H) ratio in patients with primary brain tumors probably does not result from the release of larger amounts of a normally occurring fucoglycoprotein but rather may result from the appearance in the CSF of a unique abnormal glycoprotein peculiar to the metabolism of primary brain tumor.

TRANSACTIONS & STUDIES

of

The College of Physicians of Philadelphia

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(January 1969)

(Slow) Virus Infection, Autoimmunity, and Lymphoma: An Experimental Model of Human Disease[1]

By ROBERT C. MELLORS, M.D., PH.D.[2]

NOTWITHSTANDING intensive study, there is a group of serious and widespread human disorders whose cause remains unknown: rheumatoid arthritis, systemic lupus erythematosus, and some other connective tissue diseases. The present status of research in this field has evolved in part from studies of an antibody (or autoantibody) well known to you as rheumatoid factor (11, 16). The presence of rheumatoid factor- and antibody-forming cells in large number in the rheumatoid synovial membrane (32, 35) reflects an intense reaction on the part of the body's immune defense mechanism either to endogenous (self) antigens or to exogenous (foreign) antigens. The interpretation first mentioned, that of autoimmune response to endogenous antigens, is favored (24) by the existence of a multiplicity of autoantibodies: in rheumatoid arthritis, rheumatoid factor and lupus factor; in systemic lupus erythematosus, lupus factor, other antinuclear antibodies, erythrocyte autoantibodies, and so on. The second hypothesis, that of a peculiar infectious etiology, much discussed in the older literature, is suggested anew by reports of the last year or so implicating filterable agents such as the mycoplasm (the smallest known living cells) and Bedsonia (a group of "large" viruses) in certain of the rheumatic diseases (1, 7, 10). Insofar as present knowledge allows one to judge, the two concepts are not mutually exclusive (16, 25); a systemic connective-tissue disease might be initiated by an infectious agent and perpetuated by autoimmune mechanisms.

During the last half century or so, beginning with early studies in Germany, experimentalists have been vigilant in the

[1] Theodore E. Bach Memorial Lecture III. The College of Physicians of Philadelphia, 3 January 1968.

The author's experimental work is supported in part by grants from the National Institutes of Health, United States Public Health Service.

This material was presented in part at the Seventeenth Annual Pemberton Memorial Lecture, Philadelphia, 1967, and the Gustav Stern Symposium on Perspectives in Virology, New York, 29–30 January 1968.

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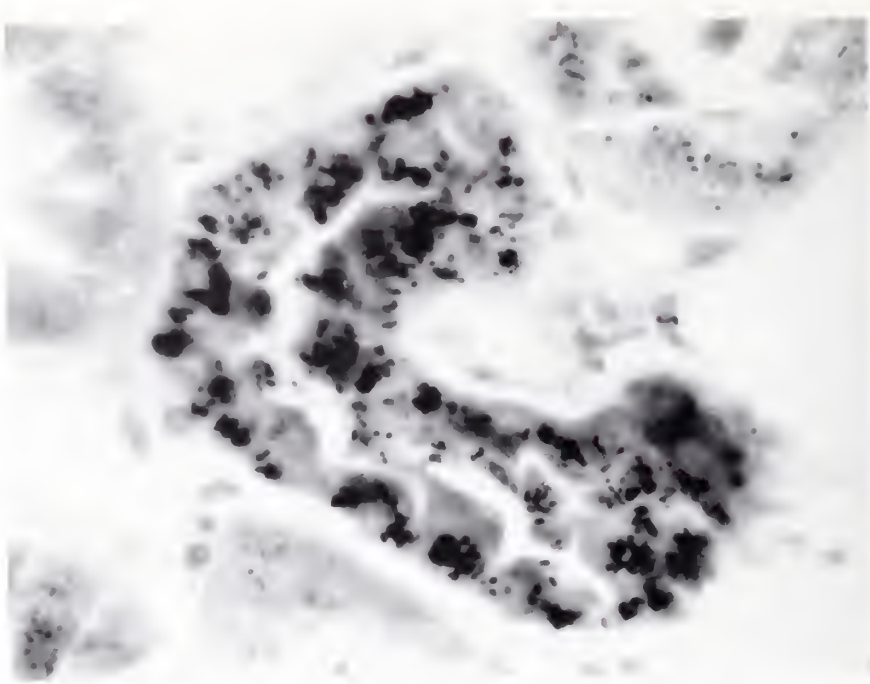

FIG. 1. Kidney of 15-month-old female NZB mouse which had severe autoimmune hemolytic anemia. Hemosiderosis of convoluted tubules (iron deposits shown by black areas). Iron stain. ×960.

search for animal disorders which in one respect or another resemble the human connective tissue diseases. A few years ago, such a disorder was uncovered in an inbred strain of mice developed in New Zealand by Dr. Marianne Bielschowsky and, black in coat color, appropriately called New Zealand Black (NZB) mice (3). Mice of this inbred strain are born healthy but with passage of time develop a triad of immunological disorders (3, 8, 13–15, 18, 20, 22, 26–31, 33, 34) which will be discussed under the headings of hemolytic, renal, and lymphomatous diseases. During the past 5 years we have studied the pathogenesis of these disorders of NZB mice (26–29) and more recently have implicated a murine leukemialike virus in etiology (30, 31, 33, 34). I welcome this opportunity to summarize the present status and possible clinical relevance of this experimental work.

Results

Hemolytic disease. When NZB mice are 4 months of age, the direct antiglobulin (Coombs) tests begin to turn positive. At about 5 months, 50% are positive; at 8 months, 99% are positive, and NZB mice thereafter develop hemolytic disease of autoimmune type. The hemolytic disease is characterized by the triad of anemia, reticulocytosis, and splenomegaly and by the autopsy findings of hemosiderosis of spleen, liver, and kidneys (Fig. 1) and extramedullary hematopoiesis in spleen and liver. The erythrocyte-bound immunoglobulins are incomplete "warm" antibodies and when eluted show specificity for mouse erythrocytes (without regard to strain), weak cross reaction with rat erythrocytes, and no reaction with the erythrocytes of other species tested. The serum shows similar serological characteristics. This work confirms the pioneer stud-

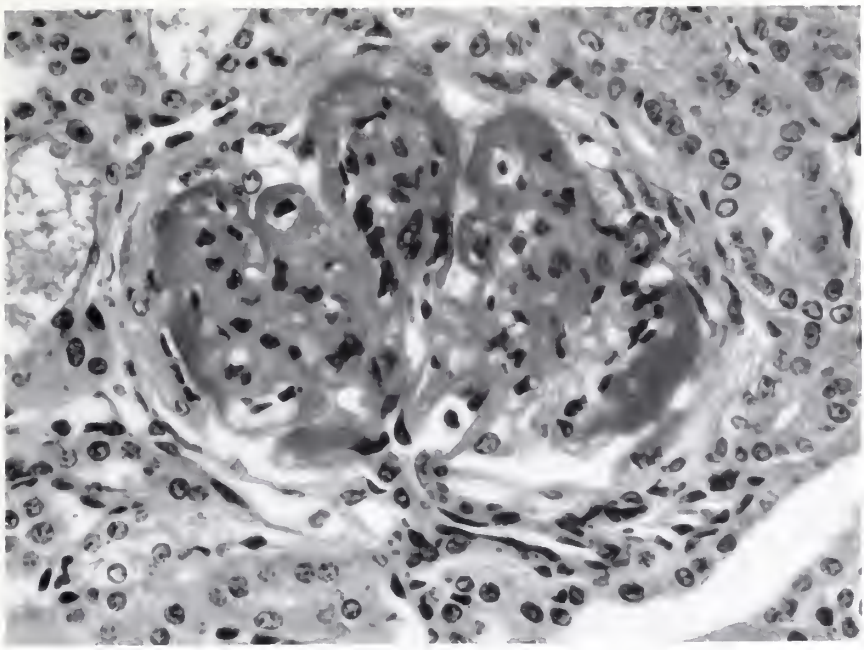

FIG. 2. Kidney of 9-month-old female NZB mouse. "Wireloop" lesion and diffuse fibrinoid alteration of glomerular capillary wall. Hematoxylin-eosin. × 180.

ies of Bielschowsky et al. (3), Helyer and Howie (15), Holmes and Burnet (18), and Long et al. (22).

Since NZB mice are highly inbred and virtually all of them, like their forbearers, develop autoimmune hemolytic disease, the disorder is thought to be inherited. Genetic studies by Helyer and Howie (14) and by Burnet and Holmes (4) seemed to bear this out in that some of the hybrid progeny produced by cross-breeding NZB mice with healthy strains of mice also developed autoimmune hemolytic disease. However, this character expressed itself in an irregular manner, and the experimental results were difficult to interpret in a wholly satisfactory manner in terms of simple Mendelian inheritance, leading Burnet and Holmes (4) to suggest from their work that both an appropriate genotype and a process of somatic mutation were necessary for the expression of NZB autoimmune disease.

Renal disease. A renal glomerular disease (11, 18, 20, 26, 28, 29) characterized by insidious onset and progressive protracted course, occasionally accelerated, is the main cause of death of NZB mice, especially females, starting at about 10 months of age. The renal disease closely resembles membranous glomerulonephritis and lupus nephritis of man (Fig. 2) and is sometimes associated with fibrinoid change in small arteries and arterioles of other organs (Fig. 3). Approximately 50% of NZB mice develop positive lupus erythematosus (L.E.) cell tests (11, 15, 29) (Fig. 4), and a larger number develop antinuclear factors (37). The renal disease is almost certainly an immunologically-mediated disorder (26, 28, 29) as shown by spleen-cell transplantation from aged to young NZB mice which accelerates the onset of renal disease, by antibody localization in the glomeruli (similar antibodies are also present in the serum and show antinuclear, antierythrocyte, and yet to be determined specificities), and by the light, immuno-

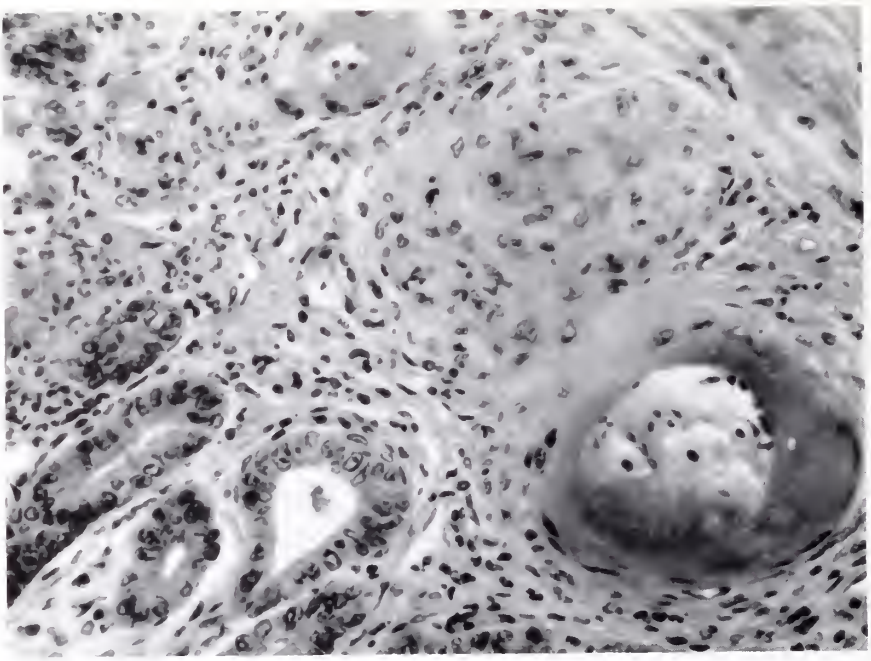

FIG. 3. Small intestine of 12-month-old female NZB mouse. Fibrinoid alteration of wall of small arteriole in submucosa, with inflammatory granuloma nearby. Hematoxylin-eosin. ×384.

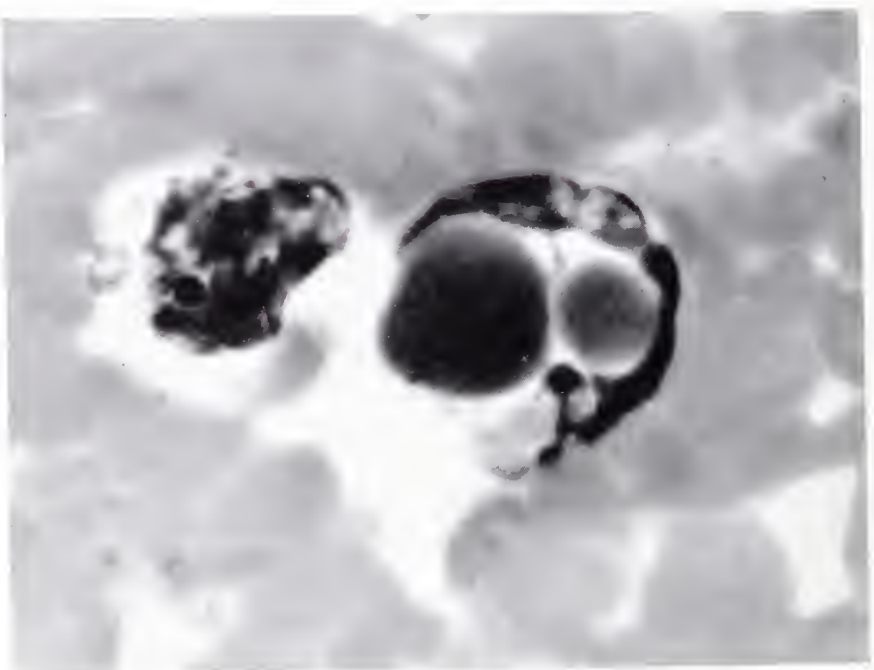

FIG. 4. 15-month-old male NZB mouse. Positive lupus erythematosus (L.E.) cell test (indicated by homogeneous inclusion bodies). Wright's stain. ×2880.

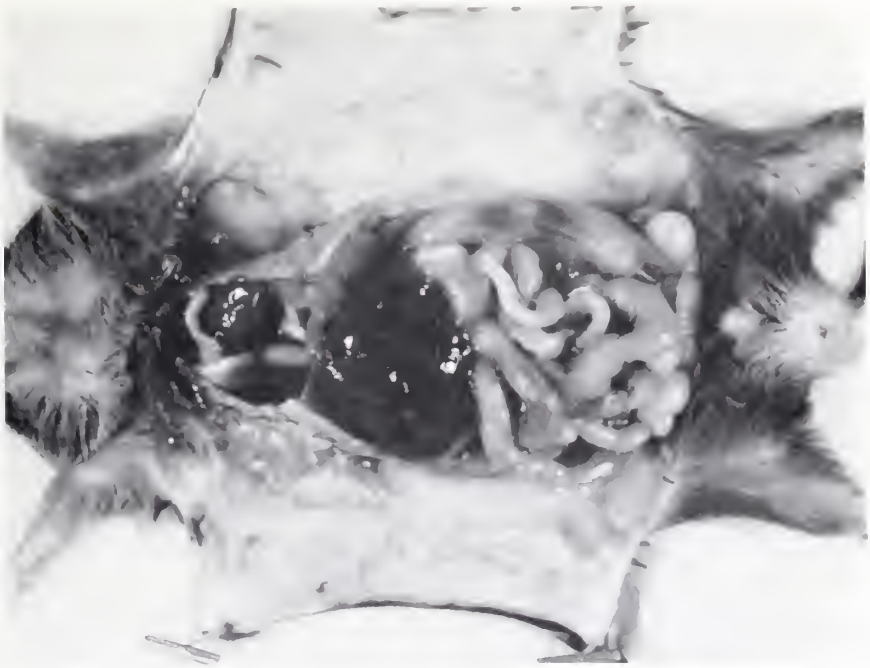

FIG. 5. NZB mouse bearing fifth successive isologous cell passage of pleomorphic lymphoma and showing typical lymphomatous enlargement of spleen (which extends to pelvis) and thymus (overlying heart). ×1.2.

fluorescence, and electron microscopic appearance of the glomerular lesions.

Lymphomatous disease. The cumulative incidence of lymphoma in NZB mice is 26% at 20 months, that is, in aged mice which by then already have the hemolytic and renal diseases just noted (8, 18, 27, 30, 31). The histopathological types are lymphosarcoma, reticulum cell sarcoma, and pleomorphic lymphoma. Pleomorphic lymphoma is so named (27) to draw attention to the diversity, as contrasted with the monotony, of malignant and benign cell-types which compose it: large primitive (stem) cells with basophilic cytoplasm, plasma cells of blastic, immature, mature, and Russell-body types, reticulum cells, and lymphocytes of various size. Needless to say, there is some problem in distinguishing this lymphoma from benign lymphoid-cell proliferation, but a demonstration of the malignant behavior of lymphoma cells by isologous transplantation resolves the issue (Fig. 5). A notable feature of pleomorphic lymphoma is the associated hypergammaglobulinemia of diffuse, or polyclonal, type (27, 30).

Murine leukemialike virus. The prevalence of lymphoma in NZB mice and the awareness that murine leukemias (and lymphomas) of several varieties, including those of heritable nature, have been shown by the work of Gross (12) and others to be caused by murine leukemia virus were among the considerations which led us to ask whether some, or all, of the seemingly heritable disorders of NZB mice might be initiated by a virus or similar infectious agent. Accordingly, studies (30, 31, 33, 34) to be discussed were undertaken on the infectivity for other strains of mice of cell-free filtrates prepared from NZB lymphomas and non-neoplastic tissues including spleen. In addition, thin sections of tissues of NZB mice from the embryo stage to aged adult were examined by electron

microscopy (33, 34) and indeed found to contain type C (2) murine leukemia virus-like particles, an observation also soon reported by others (9, 17, 41). It is appropriate to state at this point that viruslike particles of this type are not unique to mice of the NZB strain but are found in the tissues of mice from other, especially high leukemic, strains (2). However, we found that cell-free filtrates of NZB spleen or lymphoma, when inoculated into newborn or baby Swiss mice, induced in some of the recipients (after several months) hemolytic, renal, and lymphomatous diseases resembling those of NZB mice and occurring in some instances as two or three concurrent disorders in one and the same Swiss mouse (30, 31, 34). The induced diseases included hemolytic anemia with positive direct and indirect antiglobulin tests, diffuse membranous glomerulonephritis with proteinuria and hypoalbuminemia, and lymphomas of two types—lymphosarcoma with leukemic blood picture and pleomorphic lymphoma with polyclonal immunoglobulinopathy such as occurs in NZB mice. The induced lymphoma incidence was 10%, a statistically significant increase in contrast with a spontaneous lymphoma incidence of less than 1% in untreated control Swiss mice. Type C viruslike particles were demonstrated in kidneys and lymphoma of inoculated Swiss mice but not in untreated controls. Hemolytic, renal, and pleomorphic lymphomatous diseases of the type observed in the inoculated Swiss mice did not occur in untreated control Swiss mice.

Discussion

The prevalence of murine leukemia viruslike particles in the tissues of NZB mice throughout a substantial part of their life span and the transmissibility of leukemialike virus and ensuing disease complex to newborn and baby Swiss mice suggested that the necessary conditions for the pathogenic action of this agent within and outside the strain NZB were: (a) congenital or neonatal infection and (b) persistent, possibly tolerant, infection of adult mice. In this view, the virus-host relation in NZB mice resembles that which occurs in "slow virus infections" as typified, among others, by congenital lymphocytic choriomeningitis of mice (19) and Aleutian disease of mink (21). The distinguishing attributes of a slow virus disease are the ubiquitous distribution of the infectious agent within the host, the long incubation period (lasting months or years), and the progressive course of the ensuing disease. Aleutian disease of mink bears the closest similarity to the disorder of NZB mice with regard to the development of hypergammaglobulinemia, overproliferation of plasma cells, distribution of organ lesions, and some features noted in other slowly progressive viral infections. These features include: persistent infection often with viremia; genetic predisposition; vertical transmission (from generation to generation) and familial occurrence; and manifestations of autoimmunity—for example, in Aleutian disease, the development of positive antiglobulin (Coombs) tests (38). That an oncogenic virus shares attributes of the slow virus group is implicit in the findings of Bittner on the slow action of the mammary tumor agent and of Gross on the murine leukemia virus, which is now regarded as a family of RNA viruses with common as well as distinctive properties, including apparently those displayed by the leukemialike virus of NZB mice.

A possible role of immunological tolerance in the pathogenesis of slow virus disease has been illustrated by Hotchin and his associates (19) in their studies on lymphocytic choriomeningitis virus infection of mice. Mice which were inoculated with virus at birth sustained a long continued inapparent infection with high titers of virus and no detectable antiviral antibody. This persistent, possibly tolerant,

infection led after approximately ten months to a fatal, mainly renal, disease. It was suggested that this "late onset disease" might occur as a result of the gradual waning of immunological tolerance formerly exhibited by the mouse towards an otherwise harmless virus infection or, alternatively, might arise from a slow effect of the virus on target organs. At any rate, a ubiquitous virus and circulating viral antigen-antibody complexes could account for a widespread distribution of organ and connective tissue lesions, the nature of which would depend on the virus-host relationship both as regards the immune system and other systems.

In the association of autoimmune and lymphomatous disorders, NZB mice provide a uniquely challenging model of human disease. According to Dameshek and Schwartz (6), many patients with chronic lymphocytic leukemia, probably at least 20%, show autoimmune manifestations, either early in the course of the malignant disease or more frequently in its later stages. Of these manifestations, hemolytic anemia of Coombs-positive or autoimmune type is by far the most common. It is, therefore, in Dameshek's view (5), reasonable to consider the possibility that the hemolytic and malignant lymphocytic diseases are either expressions of the same fundamental disorder or an extension of one process into the other.

The occurrence of transitions between the human systemic connective tissue diseases and lymphoma, and, conversely, is of particular relevance. McDonald and Hill (23) have studied this interrelation in 29 patients, of which the first group of 22 had systemic connective-tissue disease (17, rheumatoid arthritis; two, systemic lupus erythematosus; one each, dermatomyositis, scleroderma, and rheumatoid spondylitis) followed in each instance by the development of malignant lymphoma. The remaining group of seven patients comprised five with lymphosarcoma, one with Hodgkin's disease, and one with mycosis fungoides. A systemic-connective tissue disease developed in each patient, together with positive L.E. cell tests in four, rheumatoid factor in three, and positive Coombs test in one. Comparable and more extensive observations on the occurrence of autoimmunity, connective tissue disease, and lymphoma in man—a constellation of disorders remarkably similar to that occurring in NZB mice—have been reported by Waldenström (40), Dameshek (5), Talal et al. (39), Miller (36), and others.

Summary

Mice of the inbred strain NZB spontaneously develop a triad of hemolytic, renal, and lymphomatous disorders with autoimmune manifestations and close resemblance to corresponding human diseases. A leukemialike virus is implicated in the etiology of one or more of the murine disorders. A further elucidation of the experimental model may point the way to a better understanding of comparable human diseases, including systemic lupus erythematosus, other autoimmune disorders, and lymphoid neoplasia.

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Memoir of Kehar S. Chouké 1885–1967*

By FRANCIS C. WOOD, M.D.

President, The College of Physicians of Philadelphia

THE Hira S. Chouké Lectureship is the most recently founded of the College's eight lectureships. It was established in 1955 by Dr. Kehar S. Chouké a Life-Fellow of the College, in memory of his father.

I think you will be interested in this unusual story of how a College lectureship came to be established in honor of a man, not a physician nor a scientist, who lived in a town on this globe about as far away from Philadelphia as you can imagine.

The father, Hira S. Chouké, was a native of Chouké, India, a small town founded by his ancestors. He was forced to leave school at an early age because of the death of his father. However, he managed to educate himself and add to his farm land through his own efforts. In addition to farming, he was interested in civic affairs. He won the respect of the residents of his home and neighboring town. Thus, he became the head alderman (Numbardar & Zaildar) of his district at the age of 22 and held this position for the rest of his life. He was gentle and went out of his way to do things for others. Without the benefit of formal legal training, he outwitted many brilliant attorneys, winning several court litigations, both civil and criminal. Most of his life he suffered from migraine headaches and some unknown allergy. This is the reason for the choice of the lecture subject—"allergy, headache, and allied topics."

Dr. Kehar S. Chouké, the son who established the lectureship in honor of his father, was born also in Chouké on July 23, 1885. He received the degree of L.M.P. (Licensed Medical Practitioner) with honors from the Agra Medical School, India, in 1906, and then served in the medical department of the Indian Army for seven years.

Coming to this country in October 1917, Dr. Chouké did some pre-medical work at the Universities of Illinois and Michigan and then resumed his study of medicine at the Washington University School of Medicine, St. Louis, from which he was graduated with honors in 1922. For nearly thirty years thereafter, Dr. Chouké taught anatomy, first, at Washington University and then, for fifteen years, at the University of Colorado (from which he received the M.A. degree in anatomy), serving meanwhile as visiting physician to the Out-Patient Department of the Colorado General Hospital.

In 1939, Dr. Chouké joined the faculty of the University of Pennsylvania's Graduate School of Medicine, where he taught anatomy for twelve years. He became a naturalized citizen of this country in 1946 and in the following year was elected a Fellow of The College of Physicians of Philadelphia. A member of the American Association of Anatomists, the Society for Experimental Biology and Medicine, Sigma Xi, and a Fellow of the American Association for the Advancement of Science, Dr. Chouké published some thirty papers. That these, and his teaching, were based on a profound knowledge of the literature was self-evident to regular users and the

* Read before The College of Physicians of Philadelphia preceding the Hira S. Chouké Lecture VII, 1 May 1968. Prepared and published at the request of The College of Physicians of Philadelphia.

staff of the Library of The College of Physicians during his residence in Philadelphia.

He retired from teaching in 1951 and became a member of the medical staff of the Veterans Administration Hospital at Kecoughtan, Virginia. He died on October 29, 1967, at the age of 82.

It is refreshing to realize that this lecture is named for a wonderful little boy in a small village in India, who grew up to be a fine man. His son was so proud of him that he wanted to memorialize his father, and his particular virtues, in this College. We have in this story an indication of the truth of the following statement:

Children of all ages have one thing in common,
They close their ears to advice and open their eyes to example.

Dr. Kehar S. Chouké saw in his father an example which guided him throughout his life.

Clinical and Biochemical Studies of Plasmacytic and Monocytic Dyscrasias and Their Interrelationships[1]

By ELLIOTT F. OSSERMAN, M.D[2]

Introduction

In recent years, there has been increasing interest on the part of clinicians, pathologists, immunologists, and biochemists in the broad spectrum of disease states which can be generally classified as the "plasma cell dyscrasias." The extensive studies carried out in many clinics and laboratories throughout the world have provided a wealth of information concerning the clinical aspects of these conditions and have simultaneously contributed to the clarification of the nature and composition of normal immune globulins. In no other field of medicine has there been a closer and more profitable association between clinical and laboratory investigators. Much of our present understanding of the structure of normal, functional antibodies has been derived from physicochemical and immunochemical analyses of the "pathological" M-type serum and urinary proteins elaborated in the plasma cell dyscrasias. Because M-type proteins are, for practical purposes, single proteins, in contrast to the broadly polydispersed and heterogeneous normal immunoglobulins, and since M-type proteins are available in large quantities, they serve as exceptionally useful materials for detailed structural studies.

Several terminology systems have been suggested for both the clinical patterns and the associated paraproteins by different investigative groups. With respect to the clinical patterns, the terms "dysproteinemia," "paraproteinemia," "dysglobulinemia," "monoclonal gammopathy," and "para-immunoglobulinopathy" have been suggested as general designations, and each of these has been modified and qualified by subsidiary terms such as "essential," "benign," "idiopathic," "typical," "atypical," etc., to indicate specific, or, in some instances, non-specific clinical patterns. Obviously, all of these nomenclature systems must be regarded as tentative and subject to revision as understanding of the field increases. For the present, the term "plasma cell dyscrasia" (1) has seemed to us a satisfactory general designation consistent with most of the currently available information. The term "dyscrasia" signifies an imbalanced growth of cells and is noncomittal with respect to whether the proliferation is truly neoplastic or reactive and non-neoplastic. We are increasingly aware that this critically important question is frequently impossible to answer in a specific clinical situation. Furthermore, there is now *experimental* evidence that initially-reactive plasmacytic responses can ultimately evolve into autonomous, neoplastic proliferations (2, 3), and there is some clinical evidence that this may possibly also occur in the human host (4).

The designation "plasma cell" is used to define all cells having the capacity to synthesize immunoglobulins of all major classes—again, with the recognition that there may be considerable variability in the morphologic features of these cells

[1] Hira S. Chouké Lecture VII, The College of Physicians of Philadelphia, 1 May 1968.

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which in part may reflect structural changes associated with cell maturation and functional differentiation.

Table I outlines the three major criteria which define the plasma cell dyscrasias. In the majority of cases, it is possible to document the proliferation of plasma cells by bone marrow aspiration, but it must be recognized that multiple samplings are occasionally necessary. Furthermore, in certain cases, the proliferating plasma cells are located in specific tissues and organs and may not be found unless careful examinations of these tissues are carried out. In the plasma cell dyscrasias, the proliferation of these cells occurs in the absence of an identifiable antigenic stimulus. In many ways, the most pivotal and critical criterion of the plasma cell dyscrasias refers to the *function* of these cells and their elaboration of characteristically homogeneous M-type gamma globulins or gamma globulin polypeptide subunits. These proteins are mainly demonstrated by electrophoretic analyses of the serum and urine, and the characteristic "spike" appearance of the M proteins is their major distinguishing feature, indicating, as it does, a *single population* of *structurally homogeneous* molecules. Finally, the third criterion refers to the frequently observed decrease in the synthesis of normal gamma globulins which occurs in association with and possibly as a consequence of the elaboration of the M-type proteins in the majority of these cases. This phenomenon is frequently of major functional and clinical importance but is still unexplained with respect to the precise mechanisms involved.

TABLE I

CRITERIA DEFINING THE PLASMA CELL DYSCRASIAS

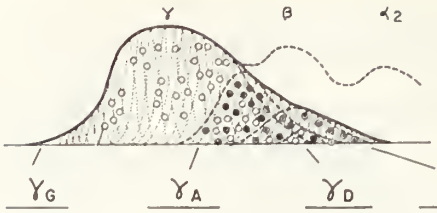
I. Proliferation of immunologically-competent cells (plasma cells) in the absence of an identifiable antigenic stimulus
II. Elaboration of homogeneous "M-type" gamma globulins and/or comparably-homogeneous polypeptide subunits of these proteins
III. Deficient synthesis of normal immunoglobulins

CHARACTERISTICS OF THE IMMUNOGLOBULINS

Figure 1 is a schematic representation of the broadly-defined gamma area of normal serum and four of the five major families of proteins which collectively comprise the immunoglobulins. The recently discovered fifth class of immunoglobulins, designated γE, are not shown in this schematic. The designations γG, γA, γD, and γM are consistent with the nomenclature system agreed upon by a committee of the World Health Organization in 1964 (5). Again, there are several other nomenclature systems which have been used, and the synonyms for each of the classes of immunoglobulins are also indicated in this figure.

The γG globulins are the largest class and are present in normal serum in a concentration of 800 to 1,500 mg. per cent. The bulk of anti-bacterial and anti-viral antibodies are of this class. Gamma-G globulins have molecular weights of the order of 160,000 with sedimentation constants of 7S. Gamma-G globulins have approximately 2.5 to 3.5 per cent of conjugated carbohydrate.

The γA globulins are present in normal serum in much lower concentration than the γG globulins, and the median electrophoretic mobility of this group of proteins is somewhat faster than that of the γG globulins. Gamma-A globulins have the same general molecular size as γG globulins, i.e., molecular weights in the range of 160,000 with sedimentation constants of the order of 7S. Gamma-A globulins are distinguished by a considerably higher content of conjugated carbohydrate, 10–12 per cent, and exhibit a tendency to form polymers with sedimentation constants of 9S and 11S. Most of the immunoglobulin



	γG	γA	γD	γM
SYNONYMS	7S γ, γ_2, IgG	γ_1A, β_2A, IgA	IgD	γM, 19S γ, β_2M, IgM
SEDIMENTATION	7S	7S (9S, 11S, polymers)	7S	19S
MOL. WT.	160,000	160,000	~160,000	~1,000,000
% CHO	2.5 - 3.5	10 - 12		10 - 15
CONC. (Mg %)	800 - 1,500	50 - 200	< 1 - 40	40 - 120

FIG. 1. Schematic representation of the cathodal end of a normal serum electrophoretic pattern, showing the distribution of four major classes of immunoglobulins (γG, γA, γD, and γM) and certain of the physical and chemical properties of each class.

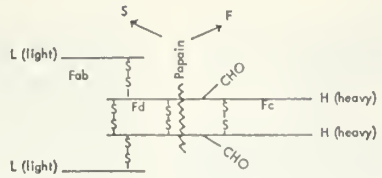
present in saliva and external secretions is of the class of γA.

Gamma-M macroglobulins are the third major group of immunoglobulins and have molecular weights in the range of 900,000–1,000,000. Recent evidence indicates that these proteins are made up of five subunits, interconnected by disulfide bridges (6). The gamma macroglobulins, like the γA globulins, have a relatively high content of conjugated carbohydrate.

The fourth family of immunoglobulins, designated the γD globulins, have molecular weights in the range of 160,000, comparable to that of the γG and γA globulins, and sedimentation constants of the order of 7S. The concentration of γD globulin in normal serum has been estimated to range from barely detectable levels to a maximum of approximately 40 mg. per cent.

Again, it should be emphasized that each of these families of immunoglobulins is itself heterogeneous and comprised of an indeterminate number of structurally and functionally specific molecules covering a range of electrophoretic mobilities.

Figure 2 is a schematic representation of the currently available information regarding the general structural features of immunoglobulin molecules. Most of the information upon which this model is based has been derived from studies of γG globulins, but the general molecular organization of the other classes of immunoglobulins is believed to be similar. As indicated in the schematic, immunoglobulin molecules are currently believed to be generally symmetrical and comprised of two pairs of polypeptide chains designated as the L (light) and H (heavy) chains, interconnected by disulfide bonds or bridges. L (light) chains are the *common* structural subunits of all classes of immunoglobulins, whereas the H (heavy) chains are the *specific* structural subunits which distinguish γG, γA, γD, γE, and γM molecules. The L chains have molecular weights of the order of 20–25,000 and have been shown to be closely related to the Bence-Jones proteins. The H chains of γG globulins have molecular weights of the order of 55,000. The carbohydrate of immunoglobulin molecules is attached to the heavy chains. As indicated in the schematic, when γG globulin molecules are digested by papain, the molecule is cleaved into the fragments designated S (slow) and F (fast) on the basis of their relative electrophoretic mobilities. The S fragment is made up of



L (light)-Chains	H (heavy)-Chains
Common structurol subunits of the γG, γA, γD, γE, and γM globulins.	Specific structurol subunits of γG, γA, γD, γE, and γM globulins.
Reloted to the Bence Jones proteins.	Unreloted to the Bence Jones proteins.
Reloted to the popoin S (slow) (Fab) fragment of γG globulin.	Related to the papain F (fast) (Fc) fragment of γG globulin.
M.W. ≅22,000	M.W. ≅55,000
Corbohydrate absent.	Carbohydrate present.

Fig. 2. Schematic representation of the structure of an immunoglobulin molecule and certain properties of its constituent polypeptide subunits. The presumed site of papain-cleavage of the molecule into the F (fast) and S (slow) fragment and their relation to the L (light) and H (heavy) chains obtained by reductive cleavage of interchain disulfide bonds is also indicated.

the L (light) chain in combination with a portion (the Fd piece) of the heavy chains. The F fragment is made up of a larger segment of the heavy chain designated as the Fc fragment, which contains the conjugated carbohydrate. At present there is a question regarding the interrelationship between the Fc and Fd fragments. It has been suggested (7) that these may be independent polypeptide subunits under separate control, rather than portions of a single polypeptide chain, and it is possible that the molecule may have six rather than four constituent polypeptide subunits. This point remains to be clarified.

Clonal Hypothesis of the Plasma Cell Dyscrasias

Presently available evidence indicates that each of the globulins which collectively comprise the normally polydispersed serum gamma globulin is the product of a specific clone of plasma cells, and normal serum contains an indeterminate number of these proteins. Normally, most of the proteins synthesized are complete molecules, and there is only a small quantity of incomplete polypeptide subunits elaborated. These incomplete proteins, designated "gamma-u," are low molecular weight constituents excreted in normal urine which closely resemble the Bence-Jones proteins. The gamma-u Bence-Jones-like constituents of normal urine are comprised of a mixture of the two structural forms of light chains designated kappa and lambda. In myeloma and the other plasma cell dyscrasias, the excessive proliferation of a *single clone* of plasma cells results in the synthesis of large quantities of a *single* protein related to one of the major classes of immunoglobulins and/or the synthesis of excessive quantities of a constituent polypeptide subunit of one of these proteins, usually of the Bence-Jones type. In contrast to the heterogeneity of normal gamma-u, the Bence-Jones proteins elaborated in a given case of plasma cell dyscrasia are *either* of Type K (kappa) or L (lambda).

Clinical Patterns of the Plasma Cell Dyscrasias

Let us now briefly review some of the clinical features of the plasma cell dyscrasias. For practical purposes, as outlined

TABLE II

Plasma Cell Dyscrasias

Clinically-overt	Clinically-occult
Multiple Myeloma	Plasma cell dyscrasias
"Primary" Amyloidosis	—of unknown significance
Heavy Chain Disease (Fc frag.)	—associated with chronic RES stimulation
Waldenström's Macroglobulinemia	—associated with non-reticular neoplasms

in Table II, the plasma cell dyscrasias can be grouped into two general categories, viz., those cases in which there is an overt and recognizable clinical pattern and those cases which are asymptomatic with respect to the plasma cell dyscrasia. Of the clinically overt plasma cell dyscrasias, plasma cell myeloma is by far the most common, and the characteristic clinical features of skeletal destruction, anemia, coagulation defects, and renal functional impairment are well known. In myeloma, the abnormal serum protein peaks are most frequently related to the 7SγG globulins (70 per cent), less commonly to the γA globulins (30 per cent), and rarely to the γD globulins. To date, only a single case of γE myeloma has been reported (8). The abnormal urinary proteins are Bence-Jones constituents of either antigenic Type K (60 per cent) or, Type L (40 per cent).

Another group of cases in which a plasma cell dyscrasia is associated with a clinically overt pattern are those generally classified as "primary" amyloidosis. It is now well established (9) that a large proportion, and probably the majority of these cases with the characteristic infiltrations of the tongue and gastrointestinal tract, heart, peri-articular regions, skin, etc. (i.e., the so-called atypical distribution of amyloid), are, in fact, examples of plasma cell dyscrasia, usually associated with a Bence-Jones-type abnormality and somewhat less commonly with γG, γA, γD and γM-type proteins. In the majority of these cases, the abnormal proliferation of plasma cells can be demonstrated by appropriate bone marrow studies, but, again, these will not be detected if a specific search is not made.

Studies by Franklin and his associates (10) at New York University and by our group (11) have defined another clinically overt form of plasma cell dyscrasia designated as "heavy chain disease." To date, only five cases of this entity have been reported, and, in all of these, the major manifestations were lymphadenopathy and hepatosplenomegaly, associated with hypersplenism. The M-proteins elaborated in these cases have been demonstrated to represent excessive quantities of the Fc fragment of the Heavy chains of γG globulins. Because these polypeptide subunits have molecular weights in the range of 55,000, their clearance rate is somewhat slower than that of Bence-Jones proteins, and they are detectable in the serum in significant concentration by routine electrophoretic analysis.

Waldenström's macroglobulinemia (12, 13) represents another clinically overt plasma cell dyscrasia in which the M-protein is related to the γM macroglobulins. The predominant clinical features in most cases of Waldenström's macroglobulinemia are anemia, bleeding manifestations, and a variable degree of lymphadenopathy and hepatosplenomegaly. In approximately 10 per cent of cases, there is associated Bence-Jones proteinuria.

In contrast to these clinical patterns with overt symptoms and signs are those cases in which plasma cell dyscrasias are discovered in essentially *asymptomatic* individuals. With the more widespread use of electrophoresis as a routine laboratory procedure, the number of cases of this type being seen in most clinics has increased rapidly in recent years. In confirmation of the original observations of Waldenström (14), it is now established that cer-

tain of these cases ultimately develop the signs and symptoms of myeloma, macroglobulinemia, or amyloidosis after periods of many months or years. Indeed, presymptomatic periods of as long as twenty years have been documented (4, 15) in cases which ultimately developed overt myeloma or macroglobulinemia, and this period will unquestionably be extended as experience with electrophoresis is accumulated.

In general, asymptomatic M-type protein abnormalities are more common in older subjects, and in many cases a background of chronic infection such as tuberculosis or syphilis is present which may possibly have represented a protracted stimulus to reticuloendothelial proliferation. In another group of cases, plasma cell dyscrasias are found in association with non-reticular neoplasms, particularly carcinomas of the large bowel, breast, oropharyngeal region, and biliary tract. Although a coincidental association cannot be excluded, particularly in older subjects, there is some evidence that the non-reticular neoplasms and the plasma cell dyscrasias in these cases may be related. From the clinical standpoint, recognition of these associations demands that a careful search be made for occult carcinomas, particularly of the large bowel, in patients with otherwise asymptomatic plasma cell dyscrasias. A fundamental question is whether M-type protein abnormalities are *invariably* manifestations of a plasma cell dyscrasia which will ultimately produce clinical symptoms if the patient survives long enough (possibly several decades), or whether certain M-type abnormalities are truly "benign" and "essential." Since this question is currently unanswerable, the term "plasma cell dyscrasia of unknown significance" is considered preferable to the designations "pre-myeloma" or "essential" or "benign" "monoclonal gammopathy" which have also been suggested.

Association of Plasma Cell Dyscrasias with Chronic Reticuloendothelial (RE) Stimulation

Although the etiological factors responsible for the induction of plasmacytic dyscrasias in man are presently undefined, it is possible that certain of the observations which have been made in recent years on a number of experimental plasma cell tumors in different inbred strains of *mice* may offer some leads. Thus, Rask-Nielsen (16), Dunn (17), and Potter et al. (18) have provided evidence for the role of genetic factors in the *spontaneous* plasma cell neoplasms in F_1 hybrids of CBA $\times$ DBA/2 strain mice and in inbred C_3H strain mice. It was further established that these spontaneous murine plasma cell neoplasms appeared more commonly in *older* animals, and in several instances they apparently originated in the lympho-reticular tissues of the ileocecal region (Dunn). The possibility was, therefore, suggested that *prolonged and repetitive stimulation of these tissues, perhaps in association with ulcerative lesions of the intestines, might have been responsible for their eventual neoplastic transformation* (17). In another inbred strain of mice, the BALB/c strain, it was shown by Merwin and Algire (19), Potter and Robertson (20), and Potter and Boyce (2, 21) that plasma cell tumors could be *induced* by the intraperitoneal introduction of a variety of substances including plastics, Freund adjuvants, and mineral oil. The common feature of these agents apparently relates to their "adjuvant" properties, that is, their ability to act as *long-term stimulants to the reticuloendothelial system* and the fact that they are *not readily eliminated by the cellular reaction which they invoke*. The *initial response* in the peritoneal cavity of the BALB/c mouse to the presence of these chronic irritants is *a diffuse granulomatous peritonitis* comprised of lymphocytes, reticulum cells, and histiocytes. Gradually, after intervals of

several weeks, the proportion of plasma cells in these granulomas increases, and this is followed after a further *interval of from six to ten months* by the *development of multiple plasma cell tumor nodules.* At this stage in their induction, a number of functionally-distinct plasma cell tumors is present in the peritoneal cavity of a single adjuvant-treated mouse. This is evidenced by the fact that *several different plasma cell tumor lines can be cloned from among the multiple nodules which develop in the primary animal.* As demonstrated by Potter, each of these tumors will continue to elaborate its own specific M-type gamma globulin product on subsequent serial transplantation to normal BALB/c recipients. The specificity of this reaction for the BALB/c strain of mice in which *spontaneous* plasma cell tumors have *never* been observed indicates the importance of genetic factors in predisposing these animals to the induction of plasmacytic neoplasms. The further possibility that the BALB/c mice may harbor a latent oncogenic virus which is simply activated by the adjuvant treatment has been suggested by the observation of virus-like particles in several of these induced neoplasms by electron microscopy [Dalton et al. (22), Parsons et al. (23)]. Since, however, it has not been possible to date to transmit any of these tumors by cell-free filtrates [Dalton et al. (22)], the pathogenic significance of these virus particles is presently unknown. Again, it should be emphasized that spontaneous plasma cell tumors have never been observed in BALB/c strain mice, and, conversely, it has not been possible to induce plasmacytic neoplasms in the two murine strains (C_3H and DBA $\times$ CBA F_1 hybrids) which have been found to be most prone to develop these tumors spontaneously. This would imply that the pathogenic factors involved in the spontaneous tumors may well be different from those which predispose to the *induction* of plasmacytic neoplasms by chronic, adjuvant-type reticuloendothelial stumulation.

Certainly, the most important question with regard to these experimental observations is their possible relevance to the plasma cell dyscrasias in man. To be sure, in the majority of cases of myeloma, macroglobulinemia, and asymptomatic plasma cell dyscrasia there are no evident predisposing factors which can be discerned by even the most detailed clinical and pathological studies, and these cases would presently have to be classified as "spontaneous" plasmacytic dyscrasias of obscure etiology. Likewise, there is usually no significant family history of similar or presumably related disorders to suggest an important role for genetic factors. However, the infrequent occurrence of plasma cell dyscrasia in close relatives would imply that, at least in some cases, these factors may be operative, and certainly this is an area which deserves more detailed clinical, immunochemical, and biochemical study.

With respect to the possibility that *plasmacytic dyscrasias may occasionally* be *induced* in *human* hosts by mechanisms similar to those described in the BALB/c murine system, we are again limited to generally circumstantial and incomplete evidence. With regard to the type of pathological process *in man* which might function in a manner similar to the intraperitoneal adjuvants in BALB/c mice, one would anticipate that it would have to be of comparably long duration, relative to the host's life span, to the six- to ten-month induction period required in the BALB/c mouse. It would further be anticipated that the process would of necessity have to be one which would not *immediately* jeopardize the host but would be associated with a chronic and persistent inflammatory response, and possibly also, at least in its initial stages, with a *diffuse* hypergammaglobulinemia. In considering the clinical material which has been assembled over the past several years, it would ap-

pear that there may be certain cases in which these conditions are satisfied. Specifically, several cases are now documented (1, 9, 21) in which long-standing and protracted chronic inflammatory processes in various sites have ultimately been associated with the development of a plasmacytic dyscrasia. The types of processes which have been implicated in this group of cases include chronic granulomatous pulmonary disease, osteomyelitis, chronic genitourinary infections, and chronic biliary tract disease. Obviously, the frequency of these conditions in the general adult population, and the relative infrequency with which they are associated with a plasmacytic dyscrasia or monoclonal gammopathy, makes it difficult to exclude the possibility of chance coincidence of unrelated conditions, but the circumstantial evidence is becoming increasingly impressive and convincing.

Evidence of an Association between Plasmacytic and Monocytic Dyscrasias in Man

I would now like to consider some more recent clinical and laboratory studies which appear to establish a clinical and possibly a pathogenic (functional) relationship between plasmacytic and monocytic dyscrasias in man. Again, I think it significant that these observations were made in the course of long-term *clinical* investigations supplemented by detailed laboratory studies. At a time when increasing emphasis is being given to so-called "basic" molecular biology, it may be appropriate to re-emphasize that much can still be learned from clinical investigations.

The particular clinical study which initially directed our attention to possible plasmacytic:monocytic interrelationships concerned a relatively young male who first developed plasma cell myeloma complicated by amyloidosis following several years of chronic urinary tract infection. Part of our initial interest in this case related to the possible association between this chronic infection and the subsequent developments of amyloidosis and plasma cell dyscrasia, and this association was discussed in the original report of this case (Case 1 in reference 9). Approximately one year after this report, following a period of symptomatic and objective remission induced by phenylalanine mustard (melphalan, 'Alkeran'®), the patient abruptly developed the clinical and hematological features of acute monomyelocytic leukemia. During this phase of the patient's illness, his urine was found to contain large quantities of a previously unidentified cationic protein. This protein was subsequently identified as the enzyme lysozyme, and the production of very large quantities of lysozyme was shown to be an apparently consistent biochemical feature of cases of monocytic and monomyelocytic leukemia (25). Additional clinical and biochemical evidence obtained from the study of subsequent cases of monocytic leukemia with hyperlysozymuria have provided further evidence of a significant association with plasmacytic and immunoglobulin abnormalities, but before considering these later studies, I would like to review certain of the features of the first case in a bit more detail (Figure 3):

Case B. Eps.: This white male had severe pustular acne as a youth with repeated suppuration and extensive residual scarring. For approximately ten years, beginning at age 30, he also had evidence of a chronic urinary tract infection attributed to prostatism and associated with dysuria and repeatedly documented pyuria and proteinuria. This condition was never adequately treated with appropriate antibiotics and local measures. In 1960, at the age of 41, he first developed back pain. Skeletal x-rays disclosed diffuse osteoporosis and scattered osteolytic lesions, and bone marrow aspiration demonstrated over 50 per cent plasma cells with a large proportion of abnormal immature forms con-

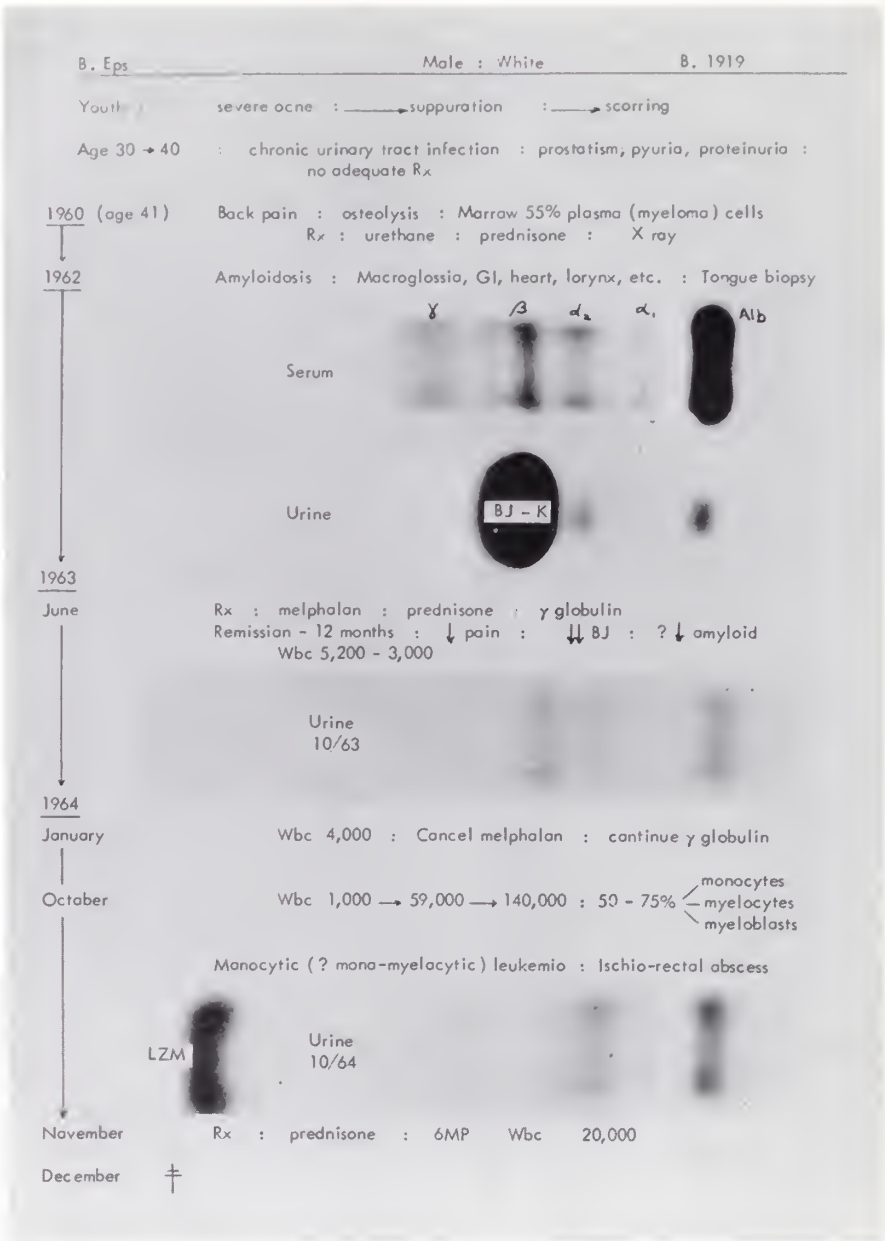


FIG. 3. Outline of clinical course and protein studies of the first case (B. Eps.) in whom monomyelocytic leukemia with lysozymuria developed following plasma cell myeloma with amyloidosis and Bence-Jones proteinuria.

sistent with a diagnosis of plasma cell myeloma. Detailed studies of serum and urinary proteins were not performed at this time. Treatment with urethane, prednisone, testosterone, and x-ray produced some transient symptomatic improvement, but insidiously over the next several months he noted progressive enlargement of his tongue, impairment in taste sensation, dryness of the mouth, and dysphagia.

Biopsy of the tongue demonstrated amyloidosis, and further studies disclosed evidence of amyloid involvement of the heart, larynx, gastrointestinal tract, skin, peri-articular tissues, thyroid, and salivary glands. At this point he was referred to our clinic for evaluation. As shown in Figure 3, electrophoresis of his serum demonstrated a decrease in gamma globulin to 0.4 grams percent. By the Immuno-Plate® method (Hyland Laboratories, Los Angeles), the hypogammaglobulinemia was shown to be due to a proportionate decrease in γG, γA, and γM globulins. There was persistent proteinuria (2–3 grams/day), and electrophoretic and immunoelectrophoretic studies disclosed a Type K Bence-Jones protein to be the major constituent, with proportionately lesser amounts of albumin and alpha globulins. Thus, at this point in his course there was unequivocal evidence of a plasma cell dyscrasia with myeloma and amyloidosis as the predominant clinical manifestations. Therapy with melphalan (l-phenylalanine mustard), prednisone, and gamma globulin was instituted in June 1963 with some symptomatic improvement and a marked decrease in Bence-Jones proteinuria for the next several months. Repeated electrophoretic analyses of his urine between October 1963 and September 1964 showed only minimal non-specific proteinuria with albumin as the major constituent. Associated with melphalan therapy, the white blood cell count decreased from the range of 5,000 to 3,000. In January 1964, melphalan was discontinued, but weekly injections of 5 cc. of gamma globulin were continued by his private physician. For the next nine months, his general condition appeared essentially stable, but the leukopenia persisted despite discontinuance of melphalan.

The first clinical and hematologic signs of the terminal monocytic dyscrasia developed very rapidly in October 1964 with weakness, fever, anemia, and thrombopenia, and an abrupt rise in the leukocyte count from 1,000 to 140,000. The peripheral blood showed 40 to 70 percent monocytes, myelocytes, and blast forms, many of which could not be classified. Concomitantly, he developed rectal pain and tenderness and evidence of an ischio-rectal abscess. Significant proteinuria also reappeared, but electrophoresis of the urinary proteins now revealed a pattern distinctly different from those previously noted. The predominant constituent now was an exceptionally basic, cationic protein which was ultimately identified (approximately fifteen months later!) as the enzyme lysozyme. The urine also contained some albumin and other non-specific proteinuria, but significantly, no Bence-Jones protein was detectable either by electrophoresis or immunoelectrophoresis. Treatment with large doses of prednisone and 6-mercaptopurine produced a significant fall in the peripheral leukocyte count but no other evidence of benefit, and he died in December.

The major clinical features of this first case and eleven subsequent cases of monocytic and monomyelocytic leukemia with lysozymuria are outlined in Table III (26). Also shown in this table are the results of immunoglobulin studies of these patients.

With respect to the previous medical histories in these cases, it is noteworthy that all but two of the twelve had a *background of significant prior chronic illnesses.* These included chronic pulmonary diseases (chronic bronchitis, emphysema, tuberculosis, and pneumonias), osteomyelitis, suppurative mastitis, chronic pyelonephritis, ileitis, and tumors of the tongue and pancreas. In the majority of cases, these conditions were symptomatic for 10 to 30 years prior to and during the terminal hematologic illness.

With respect to the serum immunoglobulins, the total serum gamma globulin concentrations determined by cellulose acetate electrophoresis (Microzone®, Beckman Instruments) were within normal

TABLE III

CLINICAL AND IMMUNOGLOBULIN STUDIES IN 12 CASES OF MONOCYTIC LEUKEMIA

Case		PREVIOUS ILLNESSES	SERUM IMMUNOGLOBULINS Total γ (Normal .9 - 1.8 Gm%)	γG (% Normal Adult)	γA (% Normal Adult)	γM (% Normal Adult)	IMMUNOELECTROPHORESIS M-Protein
1	B. Eps ♂ 44	Chronic urinary infection 1960 Myeloma and amyloid	.4	29	19	20	Urine: 1963 BJ-K
		1964 Monocytic leukemia	1.4	76	144	46	1964 LZM
2	E. Tay ♂ 59	Chronic bronchitis - emphysema - pneumonia (x 4)	2.2	138	293	39	No
3	H. And ♀ 72	Suppurative mastitis Atypical AFB (M.kons.) - gastric	2.2	135	450	51	No
4	E. Plan ♂ 70	Chronic osteomyelitis - shrapnel WW I	2.0	167	169	58	No
5	M. Plau ♀ 75	Chronic cholecystitis Carcinoid tumor of pancreas	2.1	101	127	50	Serum: M-type γG - L
6	H. Liu ♂ 76	Chronic alcoholism Gc and syphilis	1.3	58	210	92	No
7	D. Far ♀ 66	Chronic "ileitis" Chronic lung disease ? Tbc, ? abscess	2.3	126	242	234	Serum: M-type γG
8	V. Rod ♂ 72	Squamous Ca of tongue Oper. + RT	2.4	200	149	290	No
9	G. How ♀ 60	No significant previous illnesses	3.3	200	540	60	No
10	R. Pis ♂ 42	No significant previous illnesses	1.3	118	174	48	No
11	M. Riq ♀ 75	Chronic bronchitis - emphysema	1.4	95	35	350	No
12	A. Rob ♂ 55	Chronic bronchitis - emphysema - pneumonia (x 3)	.7	47	53	38	No

limits (0.9–1.8 g/100 ml) in four cases (Nos. 1, 6, 10, and 11), elevated (2.0–3.3 g/100 ml) in seven cases (Nos. 2, 3, 4, 5, 7, 8, 9), and decreased (0.7 g/100 ml) in one (No. 12). In Case 1, as previously noted, the total serum gamma globulin was significantly reduced (0.4 g/100 ml) during the initial plasmacytic dyscrasia phase of his illness, and subsequently increased to within normal limits (1.4 g/100 ml) at the time of appearance of the monocytic dyscrasia, possibly related to protracted gamma globulin administration.

Quantitation of γG, γA, and γM concentrations in the serum of these cases by single radial immunodiffusion method (Immuno-Plate® technique, Hyland Laboratories, Los Angeles) provided further evidence of immunoglobulin abnormalities. Significant elevations of one or more classes of immunoglobulins were found in 9 cases (all except Nos. 1, 5, and 12), and a significant decrease in all three immunoglob-

ulin classes was demonstrated in Case 12. Again in Case 1, γG, γA, and γM globulin levels were low in 1963 and within the range of normal (except γM) in 1964. Disproportionate elevations of γA globulin levels were found in 5 cases (Nos. 2, 3, 6, 9, and 10) and γM globulin in one (Case 11).

Even more definitive documentation of plasmacytic and immunoglobulin abnormalities, in addition to these quantitative changes, were the findings of characteristic, electrophoretically homogeneous, M-type gamma-G globulin "spikes" in the serum of Cases 5 and 7. Both of these abnormal gamma-G globulins had λ type L chains. Thus, in these two cases as well as in Case 1, the plasmacytic dyscrasias were documented by the finding of characteristic protein abnormalities.

Conclusions

Although it is presently impossible to define the precise nature of the interrelationships between the monocytic and the plasmacytic abnormalities in these cases, there would appear to be sufficient evidence to indicate that these are indeed and in fact interrelated. As previously stated, we are increasingly impressed by the possibility that protracted chronic infections and other forms of long-standing chronic reticuloendothelial stimulation may, under certain presently undefined circumstances, ultimately be responsible for the induction of plasmacytic dyscrasias. The finding of comparable background illnesses in a large proportion of our cases of monocytic dyscrasias, together with the observation of major quantitative and qualitative immunoglobulin abnormalities, has now raised the possibility of similar pathogenic mechanisms in this group of cases.

Considerable evidence has been obtained in recent years of a functional relationship between macrophages and plasma cells in the complex mechanisms involved in processing antigens and antibody synthesis (29–32). It is also well established that monocytes in the peripheral blood are members of the same cell family as tissue histiocytes and macrophages. (The evidence for these interrelationships is reviewed in detail in reference 25). On the basis of our present clinical studies, we would now suggest that the populations of monocyte-histiocyte (lysozyme-producing) cells may be susceptible to the same (or close-related) proliferative stimuli as are plasma cells. The close association of monocytic and plasmacytic dyscrasias in the present cases and their mutual associations with pre-existing chronic infections represent the principal evidence for this postulate.

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The Usefulness of Mortality and Survival Data in Existing Medical Literature[1]

By RICHARD B. SINGER, M.D.[2]

PREPARATION of a monograph on "Comparative Mortality and Survival by Medical Impairment" is being sponsored by The Association of Life Insurance Medical Directors. This is being accomplished through a series of one-year grants to the principal investigator in charge of the project, Dr. Henry J. Bakst, Professor of Preventive Medicine and Associate Dean of Boston University School of Medicine. Dr. Bakst will receive technical advice and help in statistical evaluation of articles from an Editorial Committee consisting of four medical directors appointed by the Association and three prominent actuaries.

This project was first proposed to the Executive Council of the Association in October, 1965, as a result of a recommendation made jointly by the Board of Life Insurance Medicine and the Publications Committee of the Association. An *ad hoc* committee appointed by the Executive Council reviewed the proposal and came to the conclusion that a carefully prepared monograph could be of benefit not only to those concerned with life insurance underwriting, but also to many experts engaged in clinical medicine and investigation and in public health work. The *ad hoc* committee agreed that it was beyond the capacity of its members, singly or in combination, to devote the necessary time and labor required to compile such a volume. Accordingly, the committee was enlarged by invitation to three actuaries to join in its work, and a plan was developed to have the preparation of the volume carried out under the supervision of a qualified principal investigator. Dr. Henry J. Bakst was willing to undertake this role, subject to securing necessary financial support and provision of editorial support, with particular reference to statistical advice. In the fall of 1967 the President of the Association, Dr. Albert L. Larson, with the backing of the Executive Council, made an appeal to approximately forty insurance companies for financial support to defray necessary expenses in connection with preparation of the monograph. These were estimated by Dr. Bakst to be about $50,000 over a three-year period. The response to this appeal was gratifyingly prompt, and an initial grant for one year was made to Dr. Bakst to start the project in 1968.

The potential value of such a reference volume is considered to be very high by the Editorial Committee and Dr. Bakst. Obviously the success of the project is predicated on the existence of a sufficient number of articles in the medical literature that do contain useful mortality and survival data. One preliminary listing of articles easily produced 119 references, most of which were felt to contain such data. Included were ten articles on hypertension, 15 on coronary heart disease, 24 on other cardiovascular diseases, 18 on cancer, 13 on respiratory disorders, seven on gastrointestinal, 16 on neuropsychiatric, five on endocrine and metabolic, and 11 on miscellaneous conditions. Several of these articles have been used by the Editorial

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TABLE I

LIFE TABLE CONSTRUCTION BY THE ACTUARIAL METHOD. PART I—USE OF FOLLOW-UP NUMBERS IN STARTING THE TABLE. FOLLOW-UP OF SERIES OF PATIENTS SURVIVING A FIRST MYOCARDIAL INFARCTION BY AT LEAST 30 DAYS

Year of Follow-up Y (1)	Alive at Start E (2)	Withdrawn Alive W (3)	Exposed to Risk L (4)	Deaths D (5)
0–1	932	187	838.5	80
1–2	665	149	590.5	24
2–3	492	—	—	—

Decrease in entrants $E_1 = E_0 - (W_0 + D_0)$, etc.

Exposed to risk $L = E - \frac{1}{2}W$.

TABLE II

LIFE TABLE CONSTRUCTION BY THE ACTUARIAL METHOD. PART II—CALCULATION OF OBSERVED MORTALITY AND SURVIVAL RATES

Year of Follow-up Y (1)	No. Exposed to Risk L (4)	No. of Deaths D (5)	Annual		Cumulative	
			Mortality rate q (6)	Survival rate p (7)	Survival cp (8)	Mortality cq (9)
0–1	838.5	80	.095	.905	.905	.095
1–2	590.5	24	.041	.959	.868	.132
2–3	429.5	—	—	—	—	—

Mortality rate $q = D/L$.

Survival rate $p = 1 - q$.

Decreasing Cumulative Survival $cp = (p_0)(p_1)(p_2)\cdots(p_n)$

Cumulative Mortality $cq = 1 - cp$.

Committee to test the work involved in the preparation of sample tables. Others will be used to illustrate usefulness of the data reported.

In the first five tables of this article there is a consecutive presentation of the steps in the construction of a "life table" by the actuarial method, together with three different methods of calculating comparative mortality or survival data. For this illustration use is made of an unusually complete report by Pell and D'Alonzo (1) on survival experience in a large group of duPont Company employees following an initial myocardial infarction. In Table I the starting point in the first year is actually thirty days after the myocardial infarction. Employees who died during this first month are therefore excluded, and only survivors at one month are included in the table reported here. The year of follow-up, Y, is given in the left-hand column, and the necessary data for calculating mortality or survival on an annual basis are given in the next four columns. The number of entrants alive at the start of a given follow-up period is indicated by the symbol E and these data are in column 2. Subjects withdrawn alive during a particular year of observation (because the period of observation comes to an end in that year, or because of being lost to follow-up) are shown in the next column and represented by the symbol W. The number exposed to risk in any interval, L, is easily obtained by subtracting one-half W from E. The observed number of deaths, D, is shown in the final column to the right in this table. During the first year in this case the number of entrants is reduced by 187 cases withdrawn alive and 80 deaths. By simple arithmetic one easily obtains the number of entrants for the next succeeding period of observation. These are the fundamental data that are needed in order to start the construction of the life table.

The next step in the calculation of the life table is shown in Table II. It should be noted that column headings are numbered consecutively as additional variables are presented in these first five tables. The annual mortality rate is obtained by dividing the number of deaths, D, by the number exposed to risk, L. The mortality rate, q, for the first year in this case is 0.095. The survival rate, p, is $1 - q$. The cumulative survival is given by the successive product of p for each of the individual years up to the year for which it is determined. Finally, the cumulative

mortality, cq, is 1 − cp. These relationships are shown at the foot of the table.

The steps in the calculation of the mortality ratio are shown in Table III. The initial required data are the number exposed to risk, L, and the observed number of deaths, D, as given in Table I. These are repeated in the left hand portion of Table III. To make the mortality comparison or to calculate the mortality ratio it is necessary to derive an expected number of deaths, D′, that would be anticipated in a "normal" or "standard" population of the same size and age distribution as the group of patients with myocardial infarction. For this illustration the table of normal mortality chosen is an insurance table. It is based on the combined mortality experience of male applicants in a number of large insurance companies between 1955 and 1960, male applicants who have been issued standard insurance on the basis of a satisfactory examination and other evidence of insurability. Approximately 90 per cent of all insurance applicants are eligible for standard insurance as a result of this screening process, which is admittedly not as thorough as a careful health check-up that might be done by an internist. If the values of q′ are applied to the numbers exposed to risk in the various age groups, a composite value for the entire group is obtained, which is 3.3 per thousand for the first year of follow-up, as shown in column ten. As a decimal this is expressed as 0.0033. The corresponding rate for the second year of follow-up is 4.75 per thousand. When this value of q′ is multiplied by the exposed to risk, L, the expected number of deaths, D′, is obtained, as shown in column eleven. In working with relatively small groups and low mortality rates it is necessary to present results of expected deaths as shown in column eleven, 2.77 expected deaths in the first year of follow-up. This kind of figure simply means that in a group one hundred times as large one would anticipate 277 deaths, as nearly as could be calculated by the mortality rates, as an average figure. The final step is the calculation of the mortality ratio as D/D′ which is ordinarily expressed as a percentage. This is shown in column twelve. The mortality ratio is seen to be extremely high, the observed mortality being almost 29 times higher than the expected during the first year of follow-up. There is a considerable fall in mortality ratio in the second year, although the ratio is still quite high.

TABLE III

LIFE TABLE CONSTRUCTION BY THE ACTUARIAL METHOD. PART III—CALCULATION OF EXPECTED DEATHS AND MORTALITY RATIO

Year of Follow-up	Observed		Expected*		Mortality Ratio
	No. Exposed to risk	No. of deaths	Mortality rate	No. of deaths	
Y (1)	L (4)	D (5)	q′ (10)	D′ (11)	100 D/D′ (12)
0–1	838.5	80	.00330	2.77	2880%
1–2	590.5	24	.00475	2.83	850
2–3	429.5	—	—	—	—

* Basic Select Table, Male (1955–60)
Expected no. of deaths D′ = q′L
Mortality ratio MR = 100 D/D′

It may be appropriate to mention parenthetically here that not very long ago few insurance companies would have been willing to insure any applicants with a history of myocardial infarction. This is no longer the case, although life insurance companies do require a very considerable extra premium because of the high mortality risk, and applicants are still rejected if they have not made a good recovery or if they have cardiovascular complications in addition to the history of infarction.

Table IV provides a transition from comparative mortality to comparative survival—from the index of the mortality ratio to the index of survival ratio. Those who are interested in the results of cancer treatment and therefore in follow-up stud-

TABLE IV

LIFE TABLE CONSTRUCTION BY THE ACTUARIAL METHOD. PART IV—CALCULATION OF EXPECTED SURVIVORS AND SURVIVAL RATIO.

Year of Follow-up	Observed			Expected		Survival Ratio
Y (1)	Exposed to Risk L (4)	No. of Deaths D (5)	No. of Survivors S (13)	No. of Deaths D′ (11)	No. of Survivors S′ (14)	100 S/S′ (15)
0–1	838.5	80	758.5	2.77	835.7	91%
1–2	590.5	24	566.5	2.83	587.7	96%
2–3	429.5	—	—	—	—	—

* Basic Select Table, Male (1955–60)
Number of Survivors S = L − D S′ = L − D′
Survival Ratio SR = 100 S/S′

ies of cancer patients have been particularly active in developing the concept of survival ratio. As is the case with mortality ratio the calculation of survival ratio depends on a precise estimate of the "expected" number of survivors in a normal control group similar in size, age, and sex distribution to the observed group. In Table IV the number of survivors, S, in column 13 is the difference between the number exposed to risk, L, and the corresponding number of deaths, D, both of which have been encountered in the previous tables. The difference between L and expected deaths, D′, gives the expected number of survivors, S′, and the survival ratio (column 15) is simply the ratio, S/S′, expressed as a percentage. D′, and hence S′, have been estimated by utilizing the same "basic select" mortality described in connection with Table III. This is a life insurance mortality table. Note that S and S′ are obtained by subtracting the appropriate number of deaths, not from the entrants, E, but from the number exposed to risk, L. This is made necessary by withdrawal of a significant proportion of entrants during the year of observation because of end of follow-up.

Mortality and survival are complementary. When cumulative mortality is small the corresponding survival is naturally large. It is evident that the relatively large increase in mortality ratio seen in Table III for these myocardial infarction patients is associated with a relatively much smaller decrease in survival ratio. In the first year of follow-up with 758 observed survivors instead of the expected 835.7 the survival ratio is 91 per cent. In the next year, at 96 per cent, it has reverted still closer to the normal value of 100 per cent. The survival ratio is a less sensitive index than mortality ratio to differences in excess mortality. For this reason the actuary employs mortality rates and ratios as the quantities best suited to the essential function of calculating the premiums and reserves needed to meet death claims as they occur. On the other hand, survival ratio probably gives a better perspective on the general risk to the clinician, the patient, and sometimes to the epidemiologist.

The third and final method of comparing mortality is shown in Table V. Instead of a *ratio* of observed to expected deaths, or observed to expected survivors, we have here the excess deaths expressed as the *difference* between D and D′. The number of excess deaths, ED, for the first year is 77.2, as shown in column 16. In order to standardize this figure it is customary to convert it into the number of excess deaths per thousand per year, ED, the formula being shown at the bottom of the table. In the illustration this comes to a figure of 93 per thousand per year. In

the second year of follow-up this value for ED decreases to 35 excess deaths per thousand per year.

There is an analogy between the quantity excess deaths per thousand per year and one method of calculating extra premiums (as a temporary constant premium per thousand dollars of insurance, independent of age). This is only an analogy because there are other factors such as expense and discount that influence the duration of the temporary extra premium. As a very rough and crude approximation one might think of the factor ED as similar in magnitude to such a temporary flat extra premium. It is a common practice for insurance companies to divide the extra premium required of applicants with a history of myocardial infarction into two parts: one, a table rating which is continued indefinitely unless it is reduced as a result of a subsequent re-evaluation of insurability, and the other, a temporary flat extra premium which comes off automatically after a period of years, depending on the interval since the myocardial infarction.

TABLE V

LIFE TABLE CONSTRUCTION BY THE ACTUARIAL METHOD. PART V—CALCULATION OF EXCESS DEATHS PER YEAR

Year of Follow-up Y (1)	Exposed to Risk L (4)	Observed Deaths D (5)	Expected Deaths* D′ (11)	No. of Excess Deaths ED (16)	Excess Deaths per 1000 per Yr. ed (17)
0–1	838.5	80	2.77	77.2	93
1–2	590.5	24	2.83	21.2	35
2–3	429.5	—	—	—	—

* Basic Select Table, Male (1955–60)
No. of excess deaths ED = D − D′
Excess deaths per 100 per year ed = 1000 ED/Ly

The next point to be illustrated is the fact that the mortality ratio depends not only on the numerator of the fraction, the observed deaths, but also on the mortality table used to derive the number of expected deaths, in the denominator. In Table VI we have again utilized the five-year follow-up experience of the duPont employees with a history of first myocardial infarction. Two sets of figures for number of expected deaths and mortality ratio are given. The expected deaths, D′, in column 4A are calculated as they were in the preceding illustration, utilizing mortality rates in the 1955–60 Basic Select Table for Males, an insurance mortality table. In column 4B the expected deaths are calculated from the 1960 U. S. Life Tables for White Males, a general population mortality table that would be reasonable to use for employees at plants scattered throughout the United States about 1960. Because the number of female employees and negro employees was

TABLE VI

DEPENDENCE OF MORTALITY RATIO ON MORTALITY TABLE USED TO CALCULATE EXPECTED DEATHS: 1955–60 BASIC SELECT TABLE (AN INSURANCE TABLE) COMPARED WITH 1960 U. S. LIFE TABLE

Age	Observed		Expected-A*		Expected-B*	
	No. Exposed to Risk L (2)	No. of Deaths D (3)	No. of Deaths D′ (4A)	Mortality Ratio 100 D/D′ (5A)	No. of Deaths D′ (4B)	Mortality Ratio 100 D/D′ (5B)
45	91	22	0.89	2480%	1.97	1130%
45–54	190	75	4.30	1740	11.54	650
55 up	125	54	6.21	860	17.16	315
All	397	151	11.40	1320	30.7	495

* Expected-A: Basic Select Table, Male (1955–60)
Expected-B: U. S. White Male (1960)

TABLE VII

ANALYSIS OF MORTALITY IN SHORT INTERVALS OF LESS THAN ONE YEAR. PATIENTS HOSPITALIZED AFTER FIRST MYOCARDIAL INFARCTION

Interval—y		No. of Entrants (Exposed)	No. of deaths	Mortality Rate	
				Interval	per Annum
Days	Yrs.	E	D	$q_{int} = D/E$	$q = D/(E)(y)$
(1)	(2)	(3)	(4)	(5)	(6)
0–7	0.0192	503	38	0.0755	3.92
8–14	0.0192	465	16	0.0344	1.79
15–28	0.0384	449	10	0.0222	0.58
29–61	0.0906	439	12	0.0274	0.30
0–61	0.167	503	76	0.151	0.91
62–365	0.833	427	35	0.0820	0.098

so small, no correction has been made to the mortality table for white males. For all ages combined (bottom line of the table), the mortality ratio utilizing the insurance table is 151/11.40, or 1320 per cent. The corresponding figure of 495 per cent (the ratio of 151/30.7) for the U. S. Life Table is considerably smaller because mortality in the general population is higher than in the selected population of insurance policyholders at any given age. It is evident that the choice of the most appropriate table of standard mortality is a matter of considerable importance in this kind of calculation of comparative mortality.

When the mortality risk changes rapidly over short intervals of time, it may be appropriate to calculate and study such changes over intervals of days, weeks, or months rather than years. Myocardial infarction is again a suitable condition to illustrate this type of analysis, as shown in Table VII. The series reported here (4) consisted of Veterans Administration patients hospitalized for first myocardial infarction, with quite short intervals of follow-up during the first two months of observation. The interval in days shown in column 1 has been converted to a fraction of a year in column 2. Since there were no withdrawals in this study the number of entrants, E, can be used together with the number of deaths, D, to obtain a quantity that we have called the interval mortality rate, q_{int}, shown in column 5. Because the interval varies in length it is necessary to divide the rates by the interval in years in order to get the mortality rate, q, which is customarily reserved for an annual rate. The interval rates are so high in the first two weeks that they give calculated values for q that are higher than 1.0. It is naturally impossible to obtain a greater probablity of dying than one, as the percentage dying in any group cannot exceed 100 per cent. However, calculated values of q in excess of 1.0 do provide a measure of very high mortality rates, or a measure of how much shorter than one year the interval would be in which 100 per cent deaths would be anticipated. It is evident that in this particular group approximately 15 per cent died in the first two months, and half of these died in the first week. Since this is a hospital series such figures do not reflect the impact of death of patients before they can be brought to the hospital, or survival of patients with mild or unrecognized attacks who are never hospitalized.

In many articles mortality or survival may be given on a cumulative instead of annual basis. "Five-year" survival is a commonly used interval, especially in follow-up studies of cancer patients, such as the one illustrated in Table VIII. In this series all 144 patients with gastric cancer were followed a full five years or until death within that interval (2). Since there were no withdrawals cumulative mortality, cq in column 5, is easily calculated as the ratio D/E, and cumulative mortality, cp in column 6, as S/E or 1 — cq. These patients were treated by radical resection, and the stage of the cancer was determined by the operative findings and other studies in each case, stage I representing the earliest and stage IV the most advanced cancer.

An accurate mortality ratio cannot be calculated directly from the cumulative mortality, cq. Nevertheless it is possible to take data presented in this form and convert them to average annual mortality rates which can be compared with the mortality rate of a standard population. A method for doing this is shown in Table IX. The average annual mortality rate, q_{ave}, can be readily approximated as the negative natural log of cp, divided by the number of years, y (3). The magnitude of q_{ave} ranges from 0.092 for stage I cases (column 7), or about 9 per cent per year, to 0.366 for stage IV cases, about 37 per cent per year, a very high rate. For expected mortality, q'_{ave}, we have taken mortality rates from the 1955–60 Basic Select Table for males, weighted by age and duration according to the distribution reported for all cases in the article. The mortality ratio of 1940 per cent in column 9 on the bottom line is therefore a mathematically valid calculation from the data in the article and the "normal" mortality. However, the mortality ratios for subgroups according to stage can be calculated only on the assumption that the age distribution is unchanged in comparison to the age distribution for the entire series. It is for this reason that the constant value of q_{ave} is enclosed in parentheses in the subgroups, since it is unlikely that the age distributions and q's would be identical. Nevertheless, the increase in mortality ratio from stage I to stage IV probably does reflect the actual trend in some measure. Despite lack of some data it is evident that five-year cumulative mortality of survival can be expressed in terms of comparative mortality, in some situations, at least.

The next illustration in Table X is also drawn from the literature on cancer mortality. This consists of a set of data that have been extracted and condensed from a large table of statistics on annual survival ratio in cancer cases, both male and female, all stages combined, treated in private hospitals in the period from 1942 to 1956. The table is one of many such tables in a highly informative volume entitled *Cancer Registration and Survival in California*. This is a photo-offset volume published by the Department of Health of California in 1963 (5). For illustration three specific types of cancer were selected, together with all sites in male patients and all sites in female patients. Annual survival ratio is presented in this table for a follow-up as long as 15 years, the calculations having been made in a manner very similar to that shown

TABLE VIII

USEFULNESS OF 5-YEAR SURVIVAL DATA IN PATIENTS WITH GASTRIC CANCER. PART I—CUMULATIVE MORTALITY AND SURVIVAL

Group (1)	Number of Cases: Entrants E (2)	Deaths D (3)	Survivors S (4)	Cumulative Mortality cq (5)	0–5 Years Survival cp (6)
Stage I	19	7	12	.368	.632
Stage II	66	40	26	.606	.394
Stage III	34	23	11	.676	.324
Stage IV	25	21	4	.840	.160
All	144	91	53	.632	.368

TABLE IX

USEFULNESS OF 5-YEAR SURVIVAL DATA IN PATIENTS WITH GASTRIC CANCER. PART II—CALCULATION OF ANNUALIZED AVERAGE MORTALITY RATE AND MORTALITY RATIO

Group (1)	5-Year Survival cp (6)	Annualized Ave. Observed $q_{ave} = -\ln cp/y$ (7)	Mortality Expected* q'_{ave} (8)	Approximate Mortality Ratio $100q_{ave}/q'_{ave}$ (9)
Stage I	.632	.092	(.0103)	890%
Stage II	.394	.186	(.0103)	1810
Stage III	.324	.226	(.0103)	2200
Stage IV	.160	.366	(.0103)	3600
All	.368	.200	.0103	1940

* Expected $q_{ave} = -\ln cp'/y$. With given age distribution of 144 patients (average 55) $cp' = 0.950$ at duration 5 years, Basic Select Tables, Male (1955–60).

TABLE X

ANNUAL SURVIVAL RATIOS IN CANCER PATIENTS FOLLOWED IN THE CALIFORNIA TUMOR REGISTRY

Site	Year After Diagnosis—Annual Survival Ratio %							
	1	2	3	4	5	6–7	8–10	11–15
Male, All Sites (1)	54.8	79.7	87.8	91.5	92.3	95.0	95.6	95.7
Female, All Sites (2)	71.8	85.7	90.8	92.4	94.4	95.5	96.4	97.1
Male, Lung	23.1	54.0	74.7	82.9	83.1	94.5	—	—
Male, Skin (3)	98.8	98.3	99.1	99.3	99.1	98.8	97.7	96.5
Female, Breast	90.3	88.7	90.9	90.7	93.1	93.5	95.0	96.0

(1) 26,457 Cases, all sites excluding skin other than melanoma.
(2) 38,257 Cases, all sites excluding skin other than melanoma.
(3) 4,514 Cases, skin other than melanoma.

previously in Table IV. Expected survivors each year were calculated from the exposed to risk and expected deaths on the basis of appropriate mortality tables for the state of California and the age distribution of the group. In order to keep the table from growing too large I have condensed the survival ratios for the last ten years into three intervals, representing averages for the annual ratios in years 6–7, 8–10, and 11–15 respectively. It is necessary to make a careful distinction of the annual survival ratio from the cumulative survival ratio. The latter would tend to decrease from year to year, but the annual survival ratio in this table tends to increase to a value close to but less than the normal 100 per cent. This is true of all of the five categories shown, except for skin cancer, in which the annual survival ratio is high to begin with and shows little tendency to change in the first ten years. The slightly lower figure for years 11–15 for the skin cancer patients may reflect the presence of complicating conditions rather than skin cancer.

It is apparent that the changing pattern of survival ratio is quite different for two common types of cancer, lung cancer in males which has an initial survival ratio of only 23 per cent, and breast cancer in females, which has an initial survival ratio of about 90 per cent. Despite these very different initial patterns of mortality and survival, the annual survival ratio for years 6–7 is very similar for the two conditions. The same is true for the difference between male and female cases, when all cancer sites are combined, resulting in a very large case experience. Mortality is higher and the annual survival ratio is therefore lower initially for males than it is for females, but after five years the survival ratios are very similar. The change in survival ratio in many of these categories is especially marked in the first three years. This coincides with the customary period of postponement used by most insurance companies in underwriting applicants with a history of cancer of an internal organ. The follow-up results in Table X also have a bearing on the practice of most insurance companies of substituting a temporary flat extra premium for an extra premium which varies with age and can only be removed on presentation of satisfactory evidence of insurability at a future date. The temporary flat extra premium is ordinarily imposed so that it is automatically removed ten years after operation to remove the cancer. This practice was adopted many years ago, probably in full recognition of the fact that some excess mortality may be anticipated beyond ten years. The failure of the survival ratio to attain 100 per cent in years 11–15 confirms the existence of such excess mortality. Nevertheless, the temporary flat extra pre-

mium can be used to build up a reserve sufficient to take care of such aggregate excess mortality beyond ten years, as well as the excess mortality from 4–10 years when such applicants may be at risk as policyholders.

It may be anticipated that further studies of this type, giving both survival ratio and mortality ratio on an annual basis, will provide information that is very useful to the epidemiologist and clinician, as well as the specialist in life insurance medicine.

The last example of the usefulness of survival data is drawn from an interesting article by Peel et al., which appeared several years ago in The British Heart Journal (6). The purpose of this study was to devise a "prognostic index" for patients with acute myocardial infarction and then to test its validity by careful follow-up observation. The prognostic index was based on an ingenious point score determined by factors available shortly after admission of the patient, factors such as age, sex, previous history of coronary artery disease, previous hypertension or other cardiovascular disease, circulatory findings on admission, including evidence of shock or failure, blood pressure, heart size, arrhythmias and electrocardiographic abnormalities.

The chief interest of these investigators was in "immediate" prognosis, which was defined in terms of mortality in the interval of the first four weeks after hospitalization. The prognostic index was found to work very well in predicting the early mortality q_0, as shown in column 4 of Table XI, where q_0 is the ratio of number of deaths in the first four weeks, D_0, to the number of entrants, E. The grading system used in calculating the index provided for a point score *increasing* with severity of the infarction. The early mortality was lowest, between 2 and 3 per cent, in the group with the most favorable prognostic index, a score between 1 and

TABLE XI

USE OF A PROGNOSTIC INDEX TO CLASSIFY PATIENTS WITH MYOCARDIAL INFARCTION. RELATION OF PROGNOSTIC INDEX TO EARLY MORTALITY AND LONG-TERM SURVIVAL

Prognostic Index* (1)	No. of Entrants E (2)	No. of Deaths 1st 4 weeks D_0 (3)	Early Mortality q_0 (4)	Cumulative Survival† 1 yr., cp_1 (5)	3 yr., cp_3 (6)	5 yr., cp_5 (7)
1–8	203	5	.025	.92	.79	.66
9–12	176	22	.125	.80	.55	.37
13–16	139	33	.237	.72	.33	—
17+	110	70	.637	.65	—	—
All	628	130	.206			

* Based on scores for age, sex, previous CV history, shock, failure, ECG, arrhythmia.

† Proportion of traced patients, starting with survivors at 4 weeks.

8. These were the patients with the mildest symptoms and no complications or antecedent history. This is, indeed, a low mortality for acute myocardial infarction, especially when one considers that these patients were observed and treated prior to the development of intensive coronary care units. As the score of the prognostic index rises, there is an accompanying increase in early mortality, which reaches almost 65 per cent for the worst category, with a score of 17 or more. It is evident that the overall mortality in *any* series of patients with myocardial infarction will depend on the mixture of patients with various grades of risk as illustrated here. In the total group of 628 patients of Peel et al. the early mortality is about 21 per cent. In the group of V. A. patients with myocardial infarction one can calculate from Table VII a mortality for the first four weeks of about 13 per cent. Fewer severe cases and more mild cases were, in all probablity, admitted to the 33 V. A. hospitals in the United States than occurred in a single general hospital in Glasgow, Scotland. Clinical grading or description is obviously of the utmost importance in characterizing patients with myocardial infarction or cancer, and the

study of Peel et al. is extremely useful in this regard.

The chief interest of Peel et al. was immediate prognosis: recovery of the patient to the point where he would be able to leave the hospital to convalesce. However, they also applied the prognostic index to survival up to five years after the episode, with results that were equally useful and valid, as shown in columns 5–7 in Table XI, which give cumulative survival, cp, at one year, three years, or five years. The starting point in this phase of the study was the group of patients who had survived the first four weeks. Thus, only five out of 203 patients with the best prognostic index of 1–8 died in this immediate period after hospitalization. The 198 survivors formed the starting point for the later follow-up study, for which the porportion of traced patients is shown in columns 5, 6 and 7. It should be kept in mind that the classification of patients was based on a prognostic index determined on admission to, not discharge from the hospital. There is an excellent negative correlation of cumulative survival with prognostic index. If cumulative mortality or average mortality rate were substituted for cumulative survival, the positive correlation with prognostic index would be equally good.

In life insurance medicine we also have an advantage in estimating mortality risk at a later date, because we have information regarding the interval history and the status of the patient at the time of application. We are thus able to eliminate applicants whose condition has deteriorated or continues to be questionable, even though our screening procedures are not always as thorough as we would like them to be. The resulting mortality in the selected group is even more favorable than that shown on the basis of the prognostic index determined at the time of the original myocardial infarction.

Additional examples of excellent mortality data could be given, but there is no time to present additional data here. Those who wish to pursue the subject further will find an excellent review by Blackburn and Parlin (7), and a recent study of mortality in English policyholders with a variety of impairments (8). Three additional articles of high caliber are cited in the list of references on the subject of mortality in coronary artery disease (9–11). Four additional articles present mortality or survival statistics on patients with diabetes (12), spinal cord injury (13), chronic bronchitis (14), and multiple sclerosis (15).

It has been the purpose of this paper to demonstrate the usefulness of articles containing valid mortality and survival data. I hope that the examples have been sufficient to demonstrate the existence of such articles in the medical literature in significant numbers, and their potential application to more than one area of medical science. It should now be evident why Dr. Bakst and the Editorial Committee set a high value on a reference monograph that would contain carefully prepared tables of mortality and survival statistics. There is a great deal of effort involved in the necessary operations of screening articles and preparation of the tables. In one set of sample tables developed by Dr. Bakst and members of the Committee only 40 per cent of the items were derived from the original article, and 60 per cent were supplied by calculation. Much therefore remains to be done, and it is difficult to know at this stage if a reference volume can be completed in three years, in accordance with the original estimate.

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Dr. John Kearsley, Jr.: The Mad Tory Doctor[1]

By RANDOLPH SHIPLEY KLEIN, A.M.[2]

"THY doctor is a mad Tory, and a malignant talker," countered Fighting Quaker, Hugh Wynne, when Darthea Peniston of S. Weir Mitchell's popular novel (1) complained of the brutal treatment accorded Dr. John Kearsley, Jr. Because this talented and fiery Philadelphia physician died as a political prisoner in a backcountry jail, his career is all but forgotten today. Had the colonies not succeeded in rebellion, making those loyal to the King the enemies of their country, a complimentary obituary would no doubt have marked the end of his useful, if not always laudable, life.

Born in Sedgfield, County Durham, England, probably the first son of Dr. Oliver Kearsley, young John came to Philadelphia hoping to benefit from the greater opportunities that the New World offered. Here he studied medicine under the tutelage of his uncle Dr. John Kearsley, Sr., a capable physician and talented amateur architect. By 1746, the young man was in practice, and his reputation was such that he was at times summoned to treat patients as far away as Reading, Pennsylvania, and Cape May, New Jersey. In 1749, he was one of the "practitioners of physick" who publicly warned (2) that copper still-worms used in distilling rum "may communicate a quantity of the said spirits, very pernicious to the health of those who drink them."

With Dr. John Morgan and several others, he helped found the Philadelphia Medical Society in 1766, the first such organization in British North America (3). When the Medical Society was absorbed by the American Society for Promoting Useful Knowledge in 1768, Kearsley became a member of the latter organization. Thomas Bond and several other physicians who had not been invited to join the Medical Society "revived" the Americal Philosophical Society to rival the American Society. Because Philadelphia was not large enough to support two learned societies, they soon merged to form the American Philosophical Society held in Philadelphia for Promoting Useful Knowledge. Kearsley had never attended a meeting of the American Society and showed little interest in the organization formed by the merger. No doubt Kearsley's absence may be explained by his Proprietary sympathies. He believed that the Society's president, Benjamin Franklin, or "the Electrician" as Kearsley called him (4), was "wicked enough to blind the people." He did, however, share the society's interest in the cultivation of silk and subscribed to the Pensylvania Society for the Encouragement of the Cultivation of Silk.

As a member of the medical profession, Kearsley often consulted with Drs. Cadwalader Evans, John Redman, Charles Bensell, George Glentworth, and Adam Kuhn. When his patient, Elizabeth Roberts, William Lyons' housekeeper, died of the fever in 1770, the doctor gave her body to Professor William Shippen, Jr., to use in his anatomical lectures at the College. Later he was called upon to defend his friend against the charge of grave robbing. Dr. Kearsley trained several young men. Among them were William Currie, who became a member of The College of Physicians of Philadelphia, and the intriguing "black man," James

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Derham, from the Spanish settlement in New Orleans, who as a boy was employed by Dr. Kearsley "occasionally to compound medicines and to perform some of the more humble acts of attention to his patients." Derham became a physician by 1788 at age 26 and did a three-thousand-dollar-per-year business in Philadelphia (5).

Of great significance is Dr. Kearsley's *Observations on the Angina Maligna*. This essay first appeared in the *American Magazine* in June 1769, then as a pamphlet over the pseudonym "A Lover of Pennsylvania." Later it was printed under his own name in the *Gentleman's Magazine* (6). Although the piece is neither well-organized nor even well-written prose, his descriptions are accurate and his recommendations for treatment far sounder than those of his contemporaries. Its principal value comes from the fact that it is founded on "reasoning from observation and facts, in preference to reasoning *a priori*, [which] is the only basis on which we can rest with safety (7)."

In 1746, Angina Maligna, or diphtheria, "spread itself with mortal rage" in Pennsylvania, and later it almost wiped out whole New England villages; indeed, it seemed "by its dire effects, to be more like the drawn sword of vengeance to stop the growth of the colonies than the natural progress of the disease." Most tragic was the fact that the disease generally affected "children or those under puberty, whose lax solids and spongy habits were most disposed to receive the floating miasmata of a putrid atmosphere." It also affected those "who live in low, wet and marshy places" such as Philadelphia (8).

After describing the symptoms, Kearsley admits that the strong pulse would seem to indicate the necessity of bleeding; nevertheless, he stresses time and time again, "had we complied with the indications, it would have proved a fatal error; for . . . we should thereby have encreased the progress toward putrefaction and hurried our patients into eternity." After warning against bleeding, Dr. Kearsley prescribes treatment of the patient. First, the patient should be bathed with strong warm vinegar, and "join'd with this, I have generally order'd the hot steams of vinegar, in which wormwood, centuary, Virginia snake root, galanger, myrrh and honey were boiled, to be drawn thro' a funnel into the lungs." After this the patient is ready for a "tribe of antiseptics and subastringents," bark acidulated with elixir vitrioli being absolutely essential. Finally, one should administer an infusion of one ounce of myrrh dissolved in a pound of the strongest vinegar, and mixed with a teaspoon of barley water. If the symptoms do not vanish at once, the doctor recommends a cold bath, for "in many cases of these little fevers, when every remedy has been assayed in vain, the shock of cold bathing, like the quietness of electricity, thrill'd the nervous system." So strongly did Dr. Kearsley believe in his vinegar baths for fever that he opened a small vinegar factory and operated a bath. Although modern treatment has replaced Kearsley's methods, modern physicians still praise Dr. Kearsley's courageous stand against bleeding, blistering, purging, and other evaculations which "too much reduce the natural powers of life (9)."

Kearsley had achieved eminence as a public-minded citizen and physician. In 1754, he subscribed £10 to Pennsylvania Hospital, and, in 1774, he donated his services to the Society for Inoculating the Poor against Smallpox. When the Proprietors of Pennsylvania refused to pay taxes on their western lands in 1755, Dr. Kearsley joined other concerned citizens who offered to pay the £500 share required for adequate defense during the war. In 1762, he was a manager of the lottery to raise funds to build St. Paul's Church in Chester. But Dr. Kearsley's professional

abilities and his public character could not conceal his defects as a man. Two incidents during the last seven years of his life will indicate them most clearly. In 1770, he challenged the settlement of the estate of Colonel Samuel Flower and, in 1772, that of his uncle, Dr. John Kearsley, Sr. The first resulted in a book; the second, in an unsuccessful lawsuit (10).

When Colonel Samuel Flower fell ill in 1768, Dr. Kearsley was called in to attend him, even though the colonel's son-in-law, Gerardus Clarkson, was a doctor. Although the two physicians had never been intimate friends in the past, Kearsley had given Clarkson "advice and instructed him in his *Profession* and... often recommended *Patients* to him (11)." As months passed, Clarkson came to despise Kearsley and finally charged him with trying to cheat him out of his inheritance by taking advantage of the colonel's physical and mental condition. The medical case of Samuel Flower is, therefore, relevant to the legal dispute. Flower's condition was puzzling, for it appeared to be a case of the "wandering gout," complicated by convulsive fits, numbness, failing sight, and uneasiness of mind. At first, in order "to defend the origins of the nerves, from a translation of the arthritic affection, we [Drs. Kearsley, Glentworth, and Bensell] agreed... to cut a seaton in the neck, and 'till we could procure a discharge from it, we used blisters to his ancles, and stimulating applications to his feet... the seaton discharged plentifully; and he had the return of the fits seldomer." Despite "every rational method," however, the gout would not gravitate to the extremities. The convulsive fits eventually brought about partial paralysis, and because "physicians who know how to treat diseases properly, will no doubt allow that if paralitic disorders are to be relieved, the *warming and stimulating* medicines are often the best," Dr. Kearsley prescribed "a cheerful glass." The convulsive fits not only brought about paralysis, but also were accompanied by temporary blindness. Upon consultation with Dr. George Glentworth, who had "made the *diseases* of the *eye* his particular study," Kearsley concluded that the blindness had "its seat in the nervous expansion of the retina. Surprisingly enough, therefore, in this unlikely place, the libelous *Narrative of Many Facts,* a case of the "wandering gout" is described along with its treatment (12).

The particular dispute between Kearsley and Clarkson revolved about a piece of land on Market Street which Kearsley claimed he purchased from Colonel Flower before the old man became ill. According to Kearsley, the colonel owed him money and had paid his debts with the lot which he at one time intended to give to his children. According to Clarkson, his father-in-law never gave the land to Kearsley; in fact, Kearsley owed the colonel's estate £20. Beyond this, he charged that Kearsley and the colonel's second wife had used undue influence to wrestle away other parts of Clarkson's inheritance. Clarkson succeeded in having the will set aside because of the colonel's physical and mental condition. Kearsley countered with the *Narrative of Many Facts relating to the late disputed will of Samuel Flower, Esq.; published with a view to defend an injured reputation,* a libelous account published when no laws inhibited the author, and several equally abusive articles in the *Pennsylvania Journal* and the *Pennsylvania Gazette.* Dr. Clarkson, also adept in hurling invectives, filled a whole page of the *Pennsylvania Journal* of March 8, 1770, as well as several columns of later issues, with a damning description of Dr. Kearsley:

> In truth, having been long acquainted with the Doctor's itch of *scribbling,* his vanity in exhibiting his own productions, and his disagreeable method of teazing every one that came in his way with his crude, undigested and even ungrammatical scraps... I could not but conclude from his

supercillious and dictatorial behavior . . . [the writing] was only calculated to display his own consequence and present me with some more marvelous fruits of his fertile mind (13).

The court upheld the charge against Kearsley and was no doubt justified in doing so, but in his *Narrative* Kearsley described himself as one who sought only the best interests of the children of the deceased. Reluctantly, Kearsley had accepted the colonel's entreaties to act as administrator of his estate and agent to establish harmony within the family. In attempting to fulfill these wishes, the doctor encountered the wrath of Dr. Clarkson, Richard Hockley, and the children. According to Kearsley, they "scandalized" him and "*unjustly, ungratefully,* and *cruelly* aimed to injure [him]." Although Dr. Clarkson was not blameless, it would seem that Kearsley's attitude and activities certainly encouraged his abuse. On several occasions Kearsley suggested or employed deceit. For example, although he agreed with Clarkson that Colonel Flower's second wife was "a bad woman," he suggested that Clarkson pretend to like her. Again, in attempting to dissuade Flower from disinheriting his children by leaving his money to charity, he advised "bequests for *charities,* generally had their *origin* from absurd notions that weak men entertain about the deity . . . or otherwise it was done to gratify a *pride* equally absurd and *ridiculous.*" Realizing how his readers would interpret this, he added a postscript avowing that he gave generously of what he had and merely used the above argument to convince the colonel to provide for his children. Dr. Kearsley's methods, nonetheless, were not altogether laudable (14).

Two years later, in 1772, Kearsley again displayed the baser side of his character after his uncle bequeathed a substantial amount of money to found a hospital for poor or distressed women of the Anglican communion. To his nephew, Dr. John Kearsley, Jr., he left sundry drugs, shop furniture, surgeon's instruments and the like. But John Kearsley felt he deserved a larger share of the estate, complaining in a letter to the Reverend Richard Peters, rector of Christ Church and St. Peter's, that "I have been for a Number of Years kept out of my Due, from my Uncle's behavior in signifying that at his death all would be amply made up to me," and making the astonishing proposal that a part of the sum left to the church should be given to him. This proposal was accompanied by a thinly veiled threat that unless this was done, his uncle's character would be "publickly handled (15)." In the light of Dr. Kearsley's abusive treatment of Dr. Gerardus Clarkson two years before, such a threat could not be dismissed lightly. Any hope of breaking the will vanished when the doctor became involved in the American Revolution.

The tragic conclusion to Dr. Kearsley's career began in early 1775 when he tried to organize support for British attempts to suppress the growing colonial rebellion. A zealous and rash Loyalist, Kearsley "had given much umbrage to the whigs" throughout the hot summer of 1775. The Pennsylvania Council of Safety later learned that Dr. Kearsley had urged fellow citizens to attend meetings at the Widow Ball's where they "wished and drank success to the British arms (16)." Furthermore, the doctor had collected signatures on a paper asserting all English men should combine to join the British forces when they arrived. On September 5 he is said to have entered a bookstore, taken up Tryals for High Treason, "and in a sneering insulting manner, asked . . . if this would not be a proper book for Mr. Adams to peruse (17)." By this time the most ardent supporters of liberty "deemed [him] a proper subject for the fashionable punishment of tarring, feathering, and

carting (18)." The next day he was arrested.

The details of his disgrace are vividly reported by the *Pennsylvania Journal* and by contemporaries such as Caesar Rodney, Alexander Graydon, and Christopher Marshall. Although none of those records are objective, it seems safe to agree with Marshall that the violence which occurred resulted largely from the doctor's "own madness and folly." The immediate cause of Kearsley's disgrace of September 6 was the seizing of an eminent lawyer, Isaac Hunt, who, in defending his client accused of violating the non-importation agreement, had assumed an offensive supercilious attitude toward the prosecution. As the mob carted Hunt through the streets, they halted before the door of Dr. Kearsley, one of Hunt's principal associates and advisers and now widely known as unfriendly to "the Cause." A youth knocked on the door, and, as the *Journal* records, "the doctor threw up the sash and pushed wide open the shutters, and taking up a pair of loaded pistols, cocked, presented, and snapped one of them. The crowd gave way, and one of the guards seeing the Doctor determined to take away some lives, advanced with a charged bayonet, and making a pass at his breast wounded the doctor, in the left hand. Another . . . advanced . . . the Doctor snapped a second pistol at him." A scuffle ensued, Kearsley was thrown to the ground and bruised with musket butts, then hustled into the cart amid loud "huzzas." Scarlet with rage, Kearsley was carted through the streets to the tune of the "Rogues March." To show his contempt for the people, the doctor took his wig in his wounded hand and, swinging it around his head, huzzaed louder and longer than the rest. When the procession arrived at the Coffee House, recalls Alexander Graydon, "the Doctor foaming with rage and indignation, without a hat, his wig dishevelled and bloody from his wounded hand, stood up in the cart and called for a bowl of punch. It was quickly handed to him; when, so vehement was his thirst that he drained it of its contents before he took it from his lips (19)."

The doctor's insolent behavior so angered the crowd that there were cries that he be tarred and feathered. This was not to be. A militiaman, fearing that Kearsley might be killed in the process, overturned the tar bucket (20), and the doctor was taken home under guard. Disappointed of a spectacle, the mob assaulted Kearsley's house, broke the windows and doors with stones and brickbats, and terrorized the Kearsley family. The *Pennsylvania Journal* reported the episode afterwards, placing responsibility for the extremes of the mobbing upon "a number of jolly tars, market people, and others," but defied anyone to point out any man who had suffered as much as his crimes deserved and condemned any who sympathized with Kearsley, his wife, or children. The Council of Safety, which soon took great interest in "the mad Tory doctor," remarked with notable lack of candor on September 19 as follows: "Whereas it has been reported that there is an intention formed by some . . . of publicly exposing and punishing, before conviction, certain persons supposed to be unfriendly to the cause of liberty. This Committee . . . have reason to believe said report to be altogether groundless . . . nor have they reason to apprehend any violences or irregularities of this kind from the inhabitants of the city and liberties, who have ever been remarked for their humanity and love of order." They added, however, that "no person has a right to the protection of a community or society he wishes to destroy (21)."

This final warning failed to produce any effect on Kearsley who became still bolder in his expressions of loyalty while the Whigs watched the Doctor's every move with lively suspicion. In early October,

Sheriff Dewes's son, stopping at Kearsley's house to pay a bill, entered the doctor's study unannounced and came upon Kearsley and Christopher Carter in noticeable confusion, shoving some papers from view. The young man informed the Committee of Safety of the suspicious actions, and the committee directed that both Kearsley and Carter be kept under surveillance. On October 6, 1775, Carter was seized at Chester; on his person were letters written by Dr. Kearsley, Leonard Snowden, James Brooks and himself, containing "the most infamous lyes their malice could invent, to spirit up the ministry against this City and Province, to incite them to send troops here (22)." Carter had taken passage for London on the ship *Patty* and planned to "tell a great deal which they were afraid to trust to paper" as well as deliver the letters to Lord Dartmouth by way of Thomas Corbyn and Mrs. McCalla (Macauley?). Kearsley's letters, which denounced the Whigs as "a pack of cowards," contained important military information, including a map of the Delaware River channel and location of the *chevaux de frise*. It also contained a sketch showing the brave doctor making 5,000 run merely by brandishing a pistol at them, which he sent to be engraved in London. Dr. Kearsley was arrested and confined at eleven o'clock at night on October 6. At once, the mob which seized him took all keys, opened all drawers, boxes, and closets, and carried away much of their contents (23).

On October 9, the case against the doctor and his three associates was heard by the Council of Safety. Incriminating letters were read, testimony was heard, and the prosecutors described "such a scene of villany . . . that it was thought proper to keep them confined from the fury of the populace (24)." Consequently, amid the flurry of fife and drums, the quartet was escorted by fifth associators from the State House to the greater security of the Freemasons' Lodge Room. As was the custom with gentlemen, the doctor was allowed a clerk to settle his affairs; Stephen Bayard was appointed to that position. He was, however, forbidden to transact any public business or attempt correspondence. On October 18, the Council of Safety decided to send Dr. Kearsley to York, Pennsylvania, where he would be in no position to aid the enemy. Accordingly, on October 24, at six in the morning, the doctor and Brooks departed for the interior under guard of some Light Horse troops under Captain Markoe (25).

His reputation gained over twenty-five years of practice was shattered. Dr. Kearsley, who had publicly endorsed Keyer's pills for venereal disease, was attacked in the Boston *Constitutional Gazette* as the infamous and ungrateful son of Galen who acquired a tolerable fortune by his practice and by manufacturing Keyer's pills which he sold as genuine. Philadelphians were no less hateful; on March 4, 1776, the Society of St. George, which Kearsley had helped found and had served as steward, expelled him for "having shewn himself inimical to the liberties of their country (26)."

Meanwhile, Kearsley's Loyalist passions had not abated. The Council of Safety, having heard from York that he had "insinuated himself in the good Graces of a number of Inhabitants and that they had applied for his enlargement, in order to attend them as a physician," upon considering him still "a dangerous Enemy of the American States," thought it imprudent to parole him, lest he use the opportunity to mislead "weak and credulous persons, and thereby endanger the publick Cause (27)." On October 31, 1776, as a further precaution, they ordered him removed to the jail at Carlisle (28). By now, however, the overwhelming reality of his ruin and the stresses of confinement began to affect his mind. A curious letter by Kearsley written in February, 1777, reveals

the failing of his mental powers, and his sketch of a man hanging from a gallows indicates a strong premonition that he would not survive the conflict. The letter (29) includes several lines of verse expressing his hope of British victory:

The Seed of the Thistle the Atlantic will pass
And in a new world will a great People amass
In the year Seventy four Polished they will be
In years afterward Insurections you will see
The Lilly and the Thistle both then will unite
And the Eagle tho' worn out will join in the fight
When the Lion and Dun-Cow [?] will put them to flight
Farewell then to Kirk and all its great [illegible] State
Farewell to Rebellion and see Wetherspoons fate.

In October, 1777, Dr. Kearsley complained to the Continental Congress of "the uncomfortableness of the gaol on account of the windows not being glazed," but he did not live long enough to enjoy any improvements. During the second week of November, 1777, cheered only by news of the British occupation of the American capital, the once respected Dr. John Kearsley, Jr., died, cursed and deranged. Had he died three years earlier, he would have been remembered with gratitude and lauded by eulogists. As it was, few men mourned his passing, and even his burial in the Anglican church at Carlisle "disgusted many of the Church party in that place, so that they declared against going to that church any more." James Allen, who shared Kearsley's sentiments concerning independence, confided in his diary (30): "Dr. Kearsley fell Martyr to this species of oppression."

His will, which referred to "the uncertainty of the Time . . . both from Nature and Accident in the present critical State of things and the particular Orders given about my Person," had been written October 23, 1775. To his three brothers and two sisters in England, he bequeathed all real and personal property he had received from his father, Dr. Oliver Kearsley, of Sedgfield, County Durham, England. To his wife, Mary, he left his estate and belongings at Strawberry Hill in the Northern Liberties of Philadelphia. The remainder of his estate he divided among his children, Mary, John, Joseph, Harriet, and Elizabeth, and his wife. His executors were also to provide for the education of his son, John (31).

Unfortunately for the Kearsley family, the hardships the doctor's conduct had brought did not end with his death. After Kearsley's imprisonment, Mrs. Kearsley retired with the children to their country estate. When the British occupied Philadelphia, she sought protection there. Later, in October, 1778, they left the country of their birth for England. In December, 1778, they were shipwrecked near Mazion in Cornwall and lost everything. A collection was taken for their relief (32). In her petition to the Loyalist Claims Office in 1785, she gave an accounting of her losses which warranted more than the £100 per year she then received from the government. She claimed that when the doctor was seized by the mob on September 6, 1775, the loss of furniture had been at least £94. Upon the doctor's arrest in October, the mob wrought damages to the extent of £300 to his "Library, Medicines, Surgeons Instruments, and Fixtures in Surgery." In support of Mrs. Kearsley's claim, the doctor's son-in-law, Captain Robert Douglas, testified that the doctor's loss of practice from 1775 to 1777 amounted to £2,000. Samuel Shoemaker, another witness, described Kearsley as a "violent Loyalist, one of the most zealous he ever knew," and said that his violence in politics not only lessened his practice but also shortened his life. Shoemaker reported that the doctor also lost a small vinegar factor and a small business in selling horses. In all, Mrs. Kearsley claimed the loss of £20,000 sterling in real property, considerable personal property, and a claim on part of the

£30,000 estate of her husband's uncle, Dr. John Kearsley, Sr., which he had given for charitable purposes (33).

In America, the doctor's case was viewed in a different light. President Joseph Reed of Pennsylvania, out of excessive patriotic zeal, declared with no foundation whatsoever that Kearsley's children were born out of wedlock and therefore could make no claim on his property. Taking no chances, the state attainted the doctor's son, John. In 1782, however, a notice appeared in the Philadelphia newspapers calling on anyone who had any of Kearsley's books and writings, or who owed his estate money, to settle with Hilary Baker. The doctor's property was eventually recovered by his heirs, and his will was probated (34) in Philadelphia on June 12, 1786.

Nothing in the doctor's career suggests that Kearsley would ever have reached the stature of a Morgan or Bond. The promising talent displayed at times suffered because of his ardent temper; the coming of the American Revolution destroyed any chance to fulfill his hopes. Thus, John Kearsley, Jr. died a martyr to the British cause rather than a distinguished physician who served his fellow citizens well.

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Dr. Chase's *Guide* for the Philadelphia Medical Student of 1842[1]

By CLAIRE E. FOX, PH.D.[2]

THE young man who came to Philadelphia to begin his medical education in the early 1800's entered a highly charged, very complex social scene. Philadelphia's position as the leading medical center of the United States—as well as her considerable investment in the large student population—was challenged by the thriving metropolis of New York. Such relative matters as the climate of the city, the quality of the teachers, and the facilities for clinical experience and study became important issues in the competition between the two medical centers. Medicine no longer belonged solely to wealthy young men; the ambitious students of the growing middle class also sought a place in the best educational system obtainable.

In Philadelphia, the medical schools enlarged their facilities, revamped their curricula, and prepared in other ways to accomodate the increased numbers of young men who came to the city for medical training. For the practicing physicians of the city, the supervision and training of private pupils became an important source of income. These courses of study were usually conducted in the home or clinic of the practitioner, and were accepted for degree credit by the established medical schools.

Dr. Heber Chase, a graduate of the University of Pennsylvania Medical College, Class of 1834, was one of many such enterprising practitioners. Among his several professional ventures was the publication of a textbook on hernia, used by his pupils to supplement bi-weekly private lectures on "Hernia and Analogous Diseases, Mechanical and Orthopedic Surgery." As was the custom, Doctor Chase lectured and performed clinical demonstrations at his residence on South Ninth Street in Philadelphia. Conveniently situated next door was his "Clinic for the Ruptured Poor," which provided the patients for clinical demonstrations and treatments. Students paid five dollars for a ticket to a three-month course. Practitioners who wished to avail themselves of frequent "refresher" courses in Dr. Chase's special area of competence paid ten dollars for a "perpetual" ticket. These five- and ten-dollar fees were not as high as tickets for many other private tutorials. With a reasonable degree of certainty, Dr. Chase could count on an average class of forty students, each a prospective customer for his textbook.

For the most part, medical schools had little difficulty in recruiting students, but many of the private teaching "specialists" apparently did. In order to correct this deficiency in public relations in an ethical fashion, Dr. Chase, with the assistance of other teachers and officers of various local medical societies, published *The Medical Student's Guide,* in 1842–3. The prospective medical student arriving in Philadelphia during the fall of 1842 undoubtedly found it reassuring to have a copy of the paperback *Guide* in his vest pocket for quick and accurate reference to the bewildering array of facilities which constituted the medical education of the time. The cover of *The Medical Student's Guide* described its contents thus:

> Being a Compendious View of the Collegiate and Clinical MEDICAL

[1] Section on Medical History, The College of Physicians of Philadelphia, 19 November 1968.

[2] Department of Education, Beaver College, Glenside, Pennsylvania 19038.

SCHOOLS, the Courses of Private Lectures, the Hospitals and Almhouses, and other institutions which contribute directly or indirectly to the great medical schools of Philadelphia, With the Regulations of Hours, Fees, &c., and other information of importance to students.

Accurate in almost every detail, this slim volume is recognized today as one of the most important descriptions of medical education in Philadelphia during this period.

A further impetus for the prospective student to study medicine in Philadelphia was contained in the interesting section devoted to the role of The College of Physicians. Sandwiched discreetly between course descriptions and various other related educational opportunities was a brief history of The College with a statement about its objectives, and, most importantly, a copy of the fee schedule adopted by The College in 1836. The significance of the Table of Fees is indicated by the author's assertion that The College of Physicians was considered by the State Legislature and by other public bodies to be the highest authority in matters of medical opinion. Clearly, the standards of practice and fees set by The College were recognized, important, and definitive.

The appearance of this schedule and reference to medical ethics in the 1840's was bold in comparison with the earlier attempts of The College to regulate fees in the 1820's. In 1824, the first known fee schedule had been published by The College, but the use of this document appears to have been restricted to the membership. By 1836, The College was in such a position that the members decided to print the fee schedule with its by-laws and, in addition, ordered the printing of 2,000 copies to be sent to practitioners in the city and undoubtedly to physicians in other parts of the country as well. The inclusion of this material in a handbook for students was a clear recognition of the fact that the upgrading of medicine began properly with the education of the aspirants. In the absence of licensing procedures and in an area where standards were not yet clearly defined, the fee schedule very clearly delimited for the future practitioner what was—and what was not—the proper practice of medicine. Since competitive fees were problems in medical ethics, Dr. Chase called the attention of the medical students to the fact that "The College has for the guidance of its Fellows, 'Rules of professional conduct and charges,' which may be studied to advantage by every Medical Student, in connection with other publications on Medical Ethics."

The following is the table of charges adopted by The College:

TABLE OF CHARGES FOR PROFESSIONAL SERVICES

For a single visit in a case	$1 to 10
When detained, for each hour	2 to 5
For an ordinary visit	1 to 2
When to more than one person in a family—fifty cents for each additional patient.	
For a visit at a time appointed by the patient or his friends	2
For verbal advice at the physician's house	1 to 10
For written advice	5 to 20
For rising at night, without leaving the house	1 to 5
For rising at night, and a visit	5 to 10
For a first visit in consultation	5
For subsequent visits in the same case	1 to 3
For rising at night and a visit in consultation	5 to 15
In visits to distant patients, one dollar for every mile beyond the limits of the city, in addition to the ordinary charges.	
An extra charge may be discretionally made for travelling at night or on account of the badness of the roads, or the inclemency of the weather.	
For a vaccination	5
For an ordinary case of Midwifery	10 to 20
For the application of forceps, or for turning, when in a consultation either shall be	

deemed necessary, an additional fee of	10
For any indisposition in the mother or child after the tenth day of confinement, the charge for attendance as in ordinary cases requiring medical treatment.	
For reducing Fractures	5 to 10
For reducing Luxations	5 to 30
For passing the Catheter	1 to 10
For removal of stone from the bladder	100 to 200
For amputation of leg or arm	25 to 100
For amputation of finger or toe	5 to 20
For Extirpation of large tumors	50 to 100
For trepanning	25 to 30
For the operation for Cataract	50 to 100
for Aneurisms, subclavian, carotid, femoral	100 to 200
for Hernia	25 to 100
For Fistual Lachrymalis	15 to 30
for Hare-lip	20 to 50
for Fistula in Ano	20 to 40
for Hydrocele	5 to 20
for Ascites	10 to 20

Viewed in the context of the economy of the time it is apparent that the payment scale was rather high. It surely required courage to recommend these fees when staple meat products sold from three to five cents a pound, soap and sugar for five cents, and a medical student paid from a dollar and twenty five cents to three dollars for a "coatee" and a dollar each for a vest and a pair of trousers. The medical student paid from two dollars and fifty cents to three dollars a week for board and room, and, if circumstances or habit required bathing, he could gain admission to Franklin's Bath for twenty five cents each trip or pay five dollars for the entire "season." If the student attended the University of Pennsylvania Medical School he would have paid two hundred eighty-five dollars for a two year course; and, if he attended Jefferson Medical College, the tuition was slightly lower, two hundred forty-five dollars. Tutorials ranged from five to twenty dollars per course.

When compared to the cost of living and medical education, the fees in the table of charges were not low. However, the schedule was a product of the advanced thinking on the part of conscientious leaders in the profession to elevate the practice of physic and the practitioners themselves beyond the ranks of common tradesmen, yeomen, and other similarly educated artisans. Setting fees in dollars was probably an effective way of reducing the number of times the physician was paid for his services in potatoes or smoked meats. Trading farm produce or hand-worked goods for medical services was so time-honored a method of payment that it could easily have become entrenched—to the eventual detriment of the profession. Many advocates of higher standards for medical education also believed that, if the profession was to ever merit and maintain popular respect, the physician's income had to be raised accordingly. In order to accomplish these changes it was necessary to reach all medical students and educate them to the fact that the practice of ethical medicine, including the collection of standardized fees, was American medicine's most effective weapon in its struggle for professionalization. Dr. Chase's *Guide* reflected this still relatively unpopular point of view in its well-reasoned presentation.

Of Dr. Chase himself, very little is known at present. The *Guide* appeared in only one printing, and a promised text on orthopedica never materialized. In the annals of American medical history, Dr. Chase is remembered for this valuable record of Philadelphia medical education of the 1840's. In addition, his work in compiling the *Guide*, including the statement on fees and ethics from The College of Physicians, rendered an invaluable aid to the unregulated medical profession of 1842. By the close of this fascinating decade of decisions, it was evident that almost thirty years of effort by many individuals to bring about effective communication in the profession finally had positive results.

The rivalry among the faculties of the local medical schools in Philadelphia was reduced. As medicine became a more attractive and stable profession, the competition for students between New York and Philadelphia lessened. It was too early yet for the cooperation that would eventually distinguish both centers, but the road to understanding had at least been indicated.

The American Medical Association was founded in 1847 along with innumerable local medical societies, as physicians throughout the country came to realize that medical ethics was a shared responsibility.

Heber Chase's paperbound *Guide* suggests to us that the matter of medical ethics was basic then, as it is now, to the training of the practitioner. The profession of medicine rests on this foundation.

Memoir of Walter L. Cariss 1883–1967*

By PHILIP A. MARDEN, M.D.

WALTER Linfoot Cariss, M.D., was born in Ralston, Lycoming County, Pennsylvania, on February 18, 1883, and died in Presbyterian Hospital of Philadelphia, an institution with which he had been long associated, on June 5, 1967, in his eighty-fifth year. His early education was received at the Wilmington Conference Academy in Dover, Delaware, after which he entered the University of Pennsylvania, graduating with the degree of Doctor of Medicine in 1906. As an undergraduate, Dr. Cariss was a member of the Phi Sigma Kappa and Alpha Kappa Kappa fraternities and the Sphinx Senior Society.

Dr. Cariss served internships at Delaware Hospital in Wilmington, Delaware, and Episcopal Hospital in Philadelphia. He did post-graduate work at the Polyclinic Hospital in Philadelphia where he became interested in the field of otolaryngology to which he devoted the remainder of his medical career. He was certified by the American Board of Otolaryngology in 1935. For many years Dr. Cariss maintained offices at 2043 Walnut Street and in his home at 801 North 41st Street. He had appointments in the School of Medicine and the Graduate School of Medicine at the University of Pennsylvania. In 1933, he was appointed otolaryngologist to the Presbyterian Hospital in Philadelphia and became chief of service two years later. After mandatory retirement as head of the department, Dr. Cariss continued to serve the Presbyterian Hospital as consultant as well as assuming the position of chief medical officer with responsibility for supervision of the house officers. He continued in the latter post until shortly before his death.

Dr. Cariss married Marguerite Feldpauche with whom he spent many happy years. They had no children, and Walter lovingly cared for his wife during a lengthy terminal illness.

In World War I, Dr. Cariss served for two years as captain in the United States Army Medical Corps. In 1936 he was commissioned a lieutenant commander in the United States Naval Reserve Hospital Corps.

Besides medicine, the other great interest of Walter Cariss was athletics, in particular, baseball. He had been active in sports as an undergraduate at the University of Pennsylvania, playing on the varsity baseball team all four years and serving as captain in 1905. He was also a member of the class crew and the class basketball team. After graduation, he played semi-professional baseball for a few summers. In 1923, he returned to the University of Pennsylvania as head baseball coach. For the next twenty-three years, Dr. Cariss produced teams which either won or tied for five Eastern intercollegiate championships. His teams won 270 games and lost 163 for a percentage of .624. Dr. Cariss received the Alumni Award of Merit from his alma mater in 1946. The citation read in part: "Your medical experience, gained as a teacher and physician, combined with a keen sense of good sportsmanship, have made you an ideal developer of youth. The many championships won, the number of great players developed, have attested to your skill and brought fame to Pennsylvania."

To a young intern who served under

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him in the 1930's, Dr. Cariss is remembered for his courteous and kindly manner, wavy silvery hair, twinkling blue eyes, a nose flattened from many contacts with foul tips, and for his agility in applying a mastoidectomy head dressing, of which we had more in those days. Walter would grandly draw his arm back and sweep around the patient's head with motions similar to those of a catcher trying to pick a runner off second base.

In the passing of Walter Cariss, The College of Physicians, the University of Pennsylvania and a host of patients and ball players have lost a devoted physician, coach and friend.

Memoir of William E. Ehrich
1900–1967*

By HENRY P. SCHWARZ, M.D.

WILLIAM E. Ehrich, M.D., was born in Dahmen, Germany, on November 30, 1900, and died in Philadelphia on December 25, 1967. After receiving his M.D. degree from the University of Rostock in Germany in 1924, he interned at the Hospital of the University of Freiburg i.B. and afterwards became assistant to Professor Ludwig Aschoff, then the most prominent pathologist of Europe. Professor Aschoff was so much impressed by young Dr. Ehrich that he recommended him as pathologist to the Rockefeller Institute, where Dr. Ehrich worked from 1926 to 1930. Returning to his alma mater at Rostock in 1930, he was appointed Privat Dozent (Associate Professor) for pathology. He remained in that position until 1935, when he returned to the United States to become associated with the University of Pennsylvania and later with the Philadelphia General Hospital. He was made Professor of Pathology and Chairman of the Department of Pathology at the Graduate School of the University of Pennsylvania in 1946. In 1942, he became chief of the Division of Pathology at the Philadelphia General Hospital, and, in 1962, he became Chairman of the Department of Anatomical Pathology at that institution.

Like his teacher Ludwig Aschoff, Dr. Ehrich was a complete pathologist, trying to explain the dynamics of diseases through their various stages until death. Not a "splinter specialist," Dr. Ehrich was interested in all facets of medicine and deeply concerned with the welfare of patients. His lectures, revealing the broad scope and depth of his knowledge and shaped by painstaking analysis and meticulous planning, were very much enjoyed by audiences at all levels At the postmortem table, he summarized the significance of the clinical and pathological findings in each case with a remarkable clarity that characterizes excelleuce in teaching. The unrestrained, contagious enthusiam for his work which Dr. Ehrich shared with his residents and co-workers in more intimate discussions within the department was, to many of them, a source of inspiration.

Dr. Ehrich's research on lymphoid tissue, antibody formation and inflammation contributed greatly to our knowledge of immuno-pathology. Other interesting original work involved collagen diseases, kidney disease and ground substance. He published over 150 original papers and a textbook of *Pathology for Students and Practitioners of Dentistry* (Lea and Febiger, 1941); he wrote the chapter on "Inflammation" in *Handbuch der Pathologie* (1956) and the chapter on "Lymphoid Tissues: Their Morphology and Role in the Immune Response" in the volume edited by Max Samter and Harry Alexander (Little, Brown and Co., 1965).

Dr. Ehrich was honored by the University of Freiburg i.B. in 1957 by the award of an honorary medical degree. He was awarded the W. Gerhard Medal of the Philadelphia Pathological Society in 1963. He was a Fellow of The College of Physicians of Philadelphia since 1944 and member of numerous scientific societies in this country and abroad.

Surviving are his widow, the former Marie Luise Goldschmidt, a son William G., two daughters, Mrs. A. Peter Batson and Mrs. Andre Armbruster, and nine grandchildren.

* Prepared and published at the request of the Council of The College of Physicians of Philadelphia.

Memoir of Theodore R. Fetter 1903–1967*

By JOHN B. MONTGOMERY, M.D.

THEODORE R. Fetter, M.D., was elected to Fellowship in this College on January 7, 1935. He died suddenly on January 19, 1967, following a prolonged illness due to coronary artery thrombosis.

Born in Schaefferstown, Lancaster County, Pennsylvania, on October 9, 1903, the son of Margaret Miller Fetter and John Schaeffer Fetter, he was the eleventh child in a family of fifteen children. In his early life, the family moved to Atlantic City where he grew up and attended the public schools. He received his premedical education at Lafayette College and then entered Jefferson Medical College. He was graduated in 1926 and served twenty-seven months as a rotating intern in the Jefferson Medical College Hospital. Dr. Fetter was appointed assistant in genito-urinary surgery on the staff of Professor Hiram R. Loux. He subsequently became personal assistant to Professor Thomas Stellwagen, who succeeded Dr. Loux as Professor of Genito-urinary Surgery. Dr. Fetter continued in this capacity until the ultimely death of Professor Stellwagen in 1935. During these years he worked intensively in the out-patient service and on the wards of the Jefferson Hospital, as well as on the private service of his chief. His lifelong interest in cystoscopy began during these early years through his association with the late Dr. John B. Lownes. At this time, he also came under the influence of Dr. Baxter L. Crawford, Director of Clinical Laboratories at Jefferson, who encouraged and directed his study of urological pathology.

When Dr. David M. Davis, now a Fellow of this College, was appointed in 1935 to succeed Dr. Stellwagen, Dr. Fetter was presented with the unusual opportunity of serving under a third distinguished Professor of Urology. In the succeeding years, modern urology developed rapidly, based upon the newer knowledge of physiology, microbiology and pharmacology. Dr. Davis and his staff were in the forefront of these advances. During these years, Dr. Fetter became a tower of clinical strength within this department. He rose through the ranks to the position of Associate Professor of Urology and, when Dr. Davis retired from teaching responsibilities in 1951, Dr. Fetter was appointed to succeed him as Professor of Urology and Head of the Department in the Jefferson Medical College and Hospital. In 1959, he was named Nathan Lewis Hatfield Professor of Urology.

From the day of his graduation until his sudden passing, Dr. Fetter was wholly dedicated to Jefferson Medical College. His enthusiasm and devotion to its historic background, students, young men in medicine and place in American medical education knew no bounds. He was continually active in the Jefferson Medical College Alumni Association and served as its president in 1950–1.

Throughout his professional career, Dr. Fetter's major interest centered in the study, teaching and practice of clinical urology. More than one hundred papers on a wide range of clinical subjects attest to the breadth of his interest. As a teacher, he was at his best at the bedside or in the conference room. The patient and his problem, his distress and his anxiety were always the focal points of Dr. Fetter's vigorous teaching.

* Read before The College of Physicians of Philadelphia, 1 May 1968. Prepared and published at the request of the Council of The College of Physicians of Philadelphia.

Dr. Fetter was devoted to the welfare of young men in medicine. Many regarded him as a hard taskmaster, yet he never demanded more of his students or of his residents than he did of himself. As a clinician, Dr. Fetter was truly a physician to a host of devoted patients. He was a master of the art of applying the techniques of modern medicine to the personal advantage of each individual patient. His warm friendly attitude, his personal interest, and his gentleness in technical procedures inspired confidence immediately. The patient soon looked upon him as a friend.

Early in his career, Dr. Fetter recognized an obligation to organized medicine and to the medical organizations related to his specialty. To these he gave long and devoted service, which was recognized by his election to the presidency of the Philadelphia County Medical Society, The Pennsylvania Medical Society, The Philadelphia Urological Society and the Mid-Atlantic Section of the American Urological Association. He was a member of the International Urological Society. Lebanon Valley College recognized his devotion to medicine and to public service by awarding him the honorary degree of Doctor of Science.

Dr. Fetter was a man of strong convictions. He did not hesitate to express his personal opinion concerning controversial problems of the day. His friends always knew where he stood. He sometimes appeared gruff and rigid in his attitudes. Yet, those who knew him realized that under this superficial hard shell there was a warmth of personal feeling and a deep interest in the welfare of his fellowman that marked him as a true humanitarian.

Dr. Fetter was proud of his fine family, his wife, the former Julia Winstead, and his five children: Richard, Theodore, Keith, Jeffrey and Nancy. He loved to discuss their many accomplishments with his intimate friends. In the midst of the unusual pressure of his professional obligations, he made time available to enjoy their activities and to participate in their vacations.

Throughout his life, Dr. Fetter remained proud of his family origins in Schaefferstown. A man of deep religious convictions, he remained faithful to the Lutheran Church of his youth. On January 24, 1967, he was buried there near the town of his birth.

Memoir of Bernard Goluboff 1916–1968*

By HENRY A. SHENKIN, M.D.

BERNARD Goluboff, M.D., was born in Philadelphia on October 17, 1916. He was graduated from Olney High School in 1934 and obtained a Bachelor of Arts degree in 1938 and a medical degree in 1942, both from Temple University. Following an internship at the Mount Sinai Hospital of Philadelphia, he served in the Far Eastern theatre of operations during World War II. On his return, he undertook residency training in pathology and medicine at the Mount Sinai Hospital from 1946 to 1949. He then practiced internal medicine in Philadelphia until 1965, except for a year of fellowship in the cardio-renal laboratory of the Montefiore Hospital of New York in 1952–3. In addition to practice, he constantly participated in research and was always imaginative. He participated in the establishment of a cerebral circulation laboratory at the Southern Division of the Albert Einstein Medical Center in 1951 and in a similar laboratory at the Episcopal Hospital in 1961. He left private practice and the Episcopal Hospital to enter the field of nuclear medicine, accepting a full time position in this department of the Albert Einstein Medical Center in 1965. He died on April 12, 1968, of an acute myocardial infarction.

From the first, Bernard Goluboff exhibited a scholarly approach to medicine, complementing his erudition in literature and the arts. He had an interest in, and talent for, mathematics and developed both with graduate study, despite the demands of his practice and other interests. He was a creative investigator, and, although circumstances prevented as full application in this direction as he would have liked, he finally forsook private practice to develop better this primary interest, only to have this interrupted by his premature death. His investigations were centered principally in the areas of the cerebral and renal circulations, and he published seventeen papers in this and related fields.

Dr. Goluboff had a host of friends from all walks of life and a rich family life. He was deeply devoted to his wife, Ruth, and son, Benjamin, 8. He will be sorely missed for his brilliant mind and his great wit. He was a fine human being.

* Prepared and published at the request of the Council of The College of Physicians of Philadelphia.

Memoir of Fielding Otis Lewis 1878–1965*

By AUSTIN T. SMITH, M.D.

FIELDING Otis Lewis, M.D., elected a Fellow of The College of Physicians of Philadelphia on October 6, 1915, was born in Hebberdsville, Henderson County, Kentucky, on August 20, 1878, and died in the Jefferson Medical College Hospital, Philadelphia, on May 9, 1965.

Dr. Lewis attended the Philadelphia College of Pharmacy with the view of studying medicine and was graduated from that institution in 1901. He then entered the Jefferson Medical College from which he received the degree of Doctor of Medicine in 1906. He served his internship at the Jefferson Medical College Hospital where he became interested in otolaryngology through the influence of Dr. Braden Kyle who was then Professor of Laryngology at Jefferson, and, as a result, when he completed his internship he became an associate of Doctor Kyle and began a long and brillant career in private practice and the teaching of laryngology at Jefferson, which led to his appointment as professor in 1924. His career was interrupted in 1918, when he joined the Army Medical Corps as a captain to serve in World War I. At the end of World War I, after his discharge from the army, he resumed his private practice and teaching.

Dr. Lewis became particularly interested in the surgical treatment of cancer of the larynx, and it was in this field that he attained wide recognition for his contribution to the development of the operation of total laryngectomy. Through his work and that of his contemporaries, Dr. Beck of St. Louis and Dr. MacKenty of New York City, total laryngectomy was established in this country as a cure for many cases of cancer of the larynx, which before that time were considered inoperable and hopeless. Total removal of the larynx to eradicate cancer had been tried and discarded because the high mortality rate and prolonged suffering it entailed made it a more fearsome ordeal than the disease. Dr. Lewis's pioneering efforts and accomplishments in the treatment of cancer of the larynx received wide acclaim, and, at the time of his enforced retirement in 1934 because of illness, he was recognized as an authority on this subject.

Although best known for his attainments in the surgical treatment of cancer of the larynx, Dr. Lewis was considered by his colleagues to be outstanding in all branches of otolaryngology. Sinus surgery, rhinoplasty, mastoid surgery, tonsillectomy and laryngeal surgery were done by him with the skill and thoroughness of a master craftsman. Furthermore, behind his surgical skill, there was the keen observation, diagnostic ability and medical judgement of a great clinician. To him, otolaryngology was much more than just a surgical specialty. It was, in a sense, a picture window which looked out upon the whole broad field of medical and surgical practice, and to his undergraduate students he constantly stressed the importance of being aware of the local manifestations of systemic disease in their examination of the special areas of the nose, throat and ears. Not infrequently, his own patients were indebted to him for an early diagnosis of some unsuspected systemic condition because of his alertness to the possibility that their local complaint indicated more than local disease.

* Prepared and published at the request of the Council of The College of Physicians of Philadelphia.

Dr. Lewis took an active part in both local and national medical societies and contributed important papers based upon his clinical work. He was regular in attendance at monthly meetings of the Section on Otolaryngology of The College and also at the annual meetings of the National Societies. It was his conviction that the best way for the busy clinician to keep up with the progress of medicine in his specialty was to attend and participate in the local and national meetings of his medical societies. He was a member of the American Laryngological Association, American Laryngological, Rhinological and Otological Society, American Broncho-Esophagological Association, American Academy of Opthalmology and Otolaryngology and the American College of Surgeons.

In October 1934, without premonition or warning, Doctor Lewis suffered a stroke, which compelled him to retire at the height of his career. It was a tragic disappointment to him, his colleagues, patients and friends. He accepted this cruel blow without bitterness or complaint, but with the equanimity, courage and insight of a great physician. To those who knew him well, it illustrated, more than any other incident of his brilliant career, the fine character of the man. He spent the remaining span of his long life in the quiet, beautiful surroundings of his country home, Kenmore Wood, Media, Pennsylvania.

Memoir of LeRoy M. A. Maeder 1898–1968*

By O. SPURGEON ENGLISH, M.D.

ON April 15, 1968, the medical world and the Philadelphia community lost one of its outstanding leaders in the field of psychiatry in the death of LeRoy M. A. Maeder, M.D., at the age of 69.

Dr. Maeder received his B.S. at the University of Minnesota in 1920, his M.A. in 1921, his Bachelor in Medicine in 1921 and his M.D. degree in 1922. He was a member of the Philadelphia County Medical Society, Medical Society of the State of Pennsylvania, a Fellow of the American Medical Association and a Fellow of The College of Physicians. He trained extensively in psychiatry and neurology in the United States and obtained psychoanalytic training in the Viennese Psychoanalytic Society as well as in the New York Psychoanalytic Society. He began the practice of psychoanalysis and psychiatry in Philadelphia in 1933 and was one of the few original founders of the psychoanalytic movement in this city. For well over thirty years, he was a chief force in beginning to bring organized education and training in this special field.

Dr. LeRoy M. A. Maeder received his Doctor of Law degree in 1927 from the University of Pennsylvania while he was in service at the Philadelphia General Hospital—a testimony to his work capacity, which was always prodigious.

He was the one whose initiative made possible the first society of psychoanalysis, which was followed by the establishment of an Institute in Philadelphia for the teaching and training of young psychiatrists in this branch of psychiatry. He personally analyzed many of the younger and now well-advanced analysts of this country. He always took a large burden of the Institute teaching curriculum; he was also Director of the Philadelphia Institute of Psychoanalysis for many years. Except for some interest in the forensic aspects of psychiatry, he confined himself conscientiously and whole-heartedly to the development of psychoanalysis in this area.

He was married on November 11, 1915, to Miss Alix Reichle and leaves three children: Susan, 19, Thomas, 16, and John, 13.

He was always well informed in activities and writings in the field of psychoanalysis and never shirked a responsibility he was asked to assume. He was tactful and gentlemanly in debate, but succinct and persuasive. He led a happy family life, but had the misfortune to develop Parkinson's Syndrome in his late forties. This handicap slowly progressed until his ability to communicate distinctly interfered with his work, so that a premature retirement of a partial nature was forced upon him. He eventually died in the University of Pennsylvania Hospital of virus pneumonia complicating some abdominal surgery. He was a staunch friend, a composed and devoted teacher and truly the continuous and steady, dependable and moderate leader of the development of psychoanalysis in Philadelphia from its inception. The community has lost a calm, wise, conscientious and devoted leader.

* Prepared and published at the request of the Council of The College of Physicians of Philadelphia.

Memoir of George W. Outerbridge 1881–1967*

By PETER RANDALL, M.D.

GEORGE W. Outerbridge, M.D., was born in Philadelphia on May 12, 1881. His early schooling was in Germantown and his undergraduate studies were completed at Harvard University. While at Harvard, he befriended Dr. George Stanley and was involved in the promotion of (and apparently the clandestine wagers on) a race between Dr. Stanley's new steam automobile and another competitor. Though the Stanley Steamer won handsomely, it was not equipped with brakes and was stopped at the expense of considerable shoe leather.

Dr. Outerbridge had his medical education at the University of Pennsylvania from where he was graduated in 1907. He interned at the Hospital of the University of Pennsylvania in 1908 and 1909 and became interested in gynecology. He was very academically inclined, and he made quite a name as a gynecological pathologist at the University of Pennsylvania. He soon became Chief Surgeon at the Gynecean Institute, and it was rumored that he was being groomed for the head of the Department of Gynecology at the University of Pennsylvania.

World War I broke out, and he went to France with the Pennsylvania Hospital Unit. This was one of the first units to go overseas and was attached to the British forces. His assignment, however, was a very unfortunate one. He spent two years in charge of a venereal disease clinic and came home with a complete change of heart. He lost interest in academic medicine, wrote very little and virtually dropped out of academic life. He did develop a fine private practice, and for many years he was Chief of Gynecology at the Methodist Hospital. He was also one of the first staff gynecologists at the Abington Memorial Hospital where he developed a very fine service and where he was an active consultant until the very end of his professional career.

He is remembered as a gentleman of rare quality, an outstanding gynecological pathologist and a superb surgeon. He was a Fellow of the American College of Obstetrics and Gynecology and of The College of Physicians of Philadelphia. He was also a member of the Philadelphia Obstetrical Society. After retiring, he spent many hours in the Library of The College of Physicians, but, so far as is known, he did not publish any further work.

Dr. Outerbridge was a bachelor, and, though many tried to snare him in the entanglements of matrimony, so far as can be determined, his only true love outside of medicine was the out-of-doors. His canoe trips on the Rancocas Creek became legendary, and he would go literally for years at a time without missing a single weekend, summer or winter, unless it was to canoe elsewhere in the United States. These trips were most enjoyable and usually involved a cheerful mixed group of friends. He is said to have given up his practice of obstetrics and to have devoted himself to gynecology just so he could be sure to be able to get away every weekend.

After canoeing became too much of a burden, he took to walking, and was not only President of the Philadelphia Trail Club but was also an active member of the Appalachian Mountain Club. His favorite

* Prepared and published at the request of the Council of The College of Physicians of Philadelphia.

hikes were along the Appalachian Trail, which he covered bit by bit, and he was one of the first four to complete every inch from Maine to Georgia. When he completed it, he sent his cousin a telegram which read: "A. T. fini, by G." One of the trail shelters in Pennsylvania is named in his honor, and fortunately he was able to be present at its dedication.

His bright eyes and ready wit, as well as his unwavering determination, stayed with him all the days of his life and even up to a few months before his death, at which time he could easily recall the names of lakes and rivers where he canoed forty years before. In his will, he made it quite clear that he wanted neither funeral services nor any kind of memorial.

One can presume that, like many other living wonders of nature, he preferred to be remembered as he was in his prime and only by those who knew him well.

Memoir of Jay Besson Rudolphy 1887–1968*

By EDWARD S. GIFFORD, JR., M.D.

THOSE privileged to know Jay Besson Rudolphy were deeply grieved at the passing of one of the most gentlemanly characters ever to grace the profession of medicine in Philadelphia. Patients, friends and colleagues could not mention the name of Dr. Rudolphy without a word of praise for his kindness, graciousness and courtly manners. His death occurred on February 25, 1968, at his home in Wayne.

Dr. Rudolphy was born in Hoboken, New Jersey, in 1887. He took his medical degree at Columbia University College of Physicians and Surgeons in 1915 and served his internship at the New York Post-Graduate Hospital in New York City from 1915 to 1917. Because the country was then at war, Dr. Rudolphy entered the United States Army Medical Corps and rose to the rank of captain. There was no overseas tour of duty, but Dr. Rudolphy remembered vividly the rain without and the mud within his army tent. And his spirits suffered depression as he watched the mounting piles of coffins during the influenza epidemic of 1918.

In 1919, Dr. Rudolphy left the army, and, in 1920, he came to Philadelphia for the course in ophthalmology given by the Graduate School of Medicine, University of Pennsylvania. He then entered private practice and, in 1922, was appointed assistant in ophthalmology by the University of Pennsylvania Graduate School of Medicine. He served as instructor in ophthalmology, 1923–27; associate, 1928–30; assistant professor, 1931–41, and associate professor, 1942–53. In 1928, he was certified by the American Board of Ophthalmology.

Through these years, Dr. Rudolphy was active in hospital work and was associated with the ophthalmological departments of the Episcopal and Lankenau Hospitals and with the neuro-psychiatric department of Philadelphia General Hospital. He was ophthalmic consultant to the Pennsylvania Industrial Home for Blind Women. At Pennsylvania Hospital, he served as associate ophthalmologist until mandatory retirement in 1953 and on the emeritus staff until his death. In 1965, he received a testimonial from the Philadelphia County Medical Society for his fifty years in practice. For reasons of health, Dr. Rudolphy retired from active practice in 1966 and spent his last years at his home in Wayne.

As a lover of tradition and a practitioner of the manners of an earlier age, Dr. Rudolphy was a member of the Sons of the Revolution, the St. Nicholas Society of New York, the National Society of Mayflower Descendants, in which he held the office of honorary surgeon, and the Episcopal Church. He was also a member of the American Academy of Ophthalmology and Otolaryngology, the Ophthalmic Club of Philadelphia and of The College of Physicians of Philadelphia since 1933.

I met Dr. Rudolphy in those far off days when I first handled an ophthalmoscope, probably in 1936. It was the beginning of a long and delightful association. Through many an hour we sat at adjoining desks in hospital clinics, and many a weary mile we walked together along the endless corridors of the Philadelphia General Hospital. No one could have been more considerate of youthful ignorance; no one could have been more encouraging to youthful aspiration. I welcome this opportunity to acknowledge the debt.

Dr. Rudolphy is survived by his wife, the former Edith Rondinella.

* Prepared and published at the request of the Council of The College of Physicians of Philadelphia.

Memoir of Sloan Giffin Stewart 1901–1967*

By HILTON S. READ, M.D.

SLOAN Giffin Stewart, M.D., was elected a Fellow of The College of Physicians of Philadelphia on January 8, 1934. He was born in Atlantic City on December 14, 1901, where he lived and practiced medicine until his death on September 18, 1967, caused by dissecting aortic aneurysm and extensive arteriosclerosis. His father also was an internist in Atlantic City and his brother was a pediatrician.

He attended the public schools in Atlantic City where he was more interested in athletics than in books. However, things were reversed after his graduation from Princeton, Class of 1923. At Johns Hopkins, Class of 1927, he was elected to Phi Beta Kappa and Alpha Omega Alpha and later to Sigma Xi. At the University of Pennsylvania Hospital, he was resident, instructor in medicine, and researcher, in affiliation with Drs. Stengel, Perry Pepper and Fitzhugh. After his father's death in 1933, he returned to private practice in Atlantic City where he remained until Uncle Sam beckoned in 1942. In the Army Medical Corps, he became director of the medical service at McCloskey General Hospital in Texas and was discharged in 1946 as a colonel.

Returning to Atlantic City, he was Associate in Medicine and Consultant at the Atlantic City Hospital. He was president of the staff in 1952 and also president of the County Medical Society. He was a Fellow of the American College of Physicians, a member of the Philadelphia John Morgan Society and the Atlantic City Kiwanis Club.

Dr. Stewart was married twice. He and his first wife had four boys and one girl. One son, Dr. Douglas G. Stewart, is a physician in San Francisco. Dr. Stewart was married to Frances W. Barber in 1961. He lived and had his office at 6200 Atlantic Avenue, Ventnor, for the last five years of his life. His uncle, Dr. Herbert Z. Giffin, a former chief of medicine at the Mayo Clinic, is still living, in retirement, at age 90.

Dr. Stewart was a gracious, gentle person, a keen physician, a valued friend and an excellent companion. He had a reserved dignity that inspired confidence in his patients who were devoted to him and made him a much-requested consultant. Despite being a gourmet, he retained his youthful figure and vigor to the envy and complete despair of his colleagues. His passing has left a rent in the community fabric, a void in the reservoir of medical talent and a sense of personal loss in all of us.

* Prepared and published at the request of the Council of The College of Physicians of Philadelphia.

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

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Robert E. Jones MD

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Survival? Man and Water: A Community Health Forum[1]

The Mary Scott Newbold Symposium[2]

Chairman

FRANCIS C. WOOD, M.D. *President, The College of Physicians of Philadelphia*

Moderator

EARL FINBAR MURPHY, Esq., *Professor of Law, Temple University, Philadelphia*

Participants

RUTH PATRICK, Ph.D., *Chairman, Department of Limnology, The Academy of Natural Sciences of Philadelphia*

SAMUEL S. BAXTER, *Commissioner, Water Department, City of Philadelphia*

M. GORDON WOLMAN, Ph.D., *Chairman, The Isaiah Bowman Department of Geography, The Johns Hopkins University, Baltimore*

(*Dr. Wood*) This symposium is being given under the joint auspices of the Philadelphia County Medical Society and The College of Physicians. It is supported by the Mary Scott Newbold Fund.

Sixty-two organizations in this community have joined us in this enterprise. A number of the supporting organizations asked first if this were to be an emotional political rally or a scientific fact-finding activity. We reassured them all that we would avoid the former with all our capacities.

Irving Fisher, in his book about stabilizing the dollar, written in 1920—so long ago that most of you were not born at that time—said in his introduction, "A great teacher once said to his students, 'Divide the study of every social situation into four parts: what is it, why is it, what

[1] Presented by The College of Physicians of Philadelphia in cooperation with the Philadelphia County Medical Society at The College of Physicians of Philadelphia, 9 November 1968.

[2] Mary Scott Newbold Lecture LXXXIX, The College of Physicians of Philadelphia, presented as a symposium.

of it and what are you going to do about it—the facts, the causes, the resultant evils and the remedies.' " Our reason for holding this symposium is to get at these problems.

Now in the recent past, the Philadelphia County Medical Society has been much more active in community health and welfare than The College of Physicians has been, and it gives me great pleasure, therefore, to introduce Dr. Katharine Sturgis, the first woman president of the County Society, who has been a powerful influence in public health and welfare over the years.

(*Dr. Sturgis*) Dr. Wood, it is really true that the County Medical Society of Philadelphia has been the one to whom we have looked for interest in the community in practical affairs, and it is a marvelous thing that this is no longer true. The County Medical Society and The College of Physicians are *both* deeply involved in the public good these days.

It is amazing that man with his ingenuity has been so slow to consider the impact of his ingenuity. It is a fine thing, therefore, that we are turning in medicine to solutions of environmental problems. This is long overdue.

When I saw Wolman's name up here on the card, I thought, "Oh, good heavens, Abel Wolman." I tried to get him on the telephone yesterday and they said that he was out of town and here he was coming here. I forgot that it was Abel's eminent son, Red Wolman.

Dr. Abel Wolman, just a few weeks ago, received the first Lewis Dollinger Pure Environment Award at Franklin Institute. This is a very curious award. It is for environmental science, and it shows a fetus in utero. I happen to edit a medical journal and wanted to pay tribute to Abel Wolman, so I wrote to Lawrence LePage at Franklin Institute and requested Dr. Wolman's citation. Along with the citation, Dr. LePage sent me a picture of the actual award. My editorial secretary said, "Sure, the perfect environment: the fetus in utero!" I said, "No, we have put a lot of emphasis on genetics, and the lay public feels that the perfect environment is the fetus in utero, but this is no longer true. We can no longer separate genetics from the external environment, because the external environment has an impact on that fetus in utero, the exact nature of which we are not sure, but it is time that we took a long look." I think it's a great privilege that the County Medical is co-sponsoring this morning's symposium, taking a look at our environment.

(*Dr. Wood*) Dr. Elizabeth Rose, of the Committee on Public Health and Preventive Medicine, has assembled for us this morning a remarkable group of participants. Each is a real student and a scholar in some important area relating to the subject of water supply and water pollution.

Dr. Earl Finbar Murphy, Professor of Law at Temple University, is an Associate in the Institute of Law and Health Science. He wrote a book in 1961 on water purity, and he published a book last year on governing nature. He is a member of the Advisory Panel of the Office of Water Resources Research in the U. S. Department of the Interior. He is chairman of the Board of Governors of the American Institute of Urban and Regional Affairs. He is on the Technical Committee of the Institute for the Development of Riverine and Estumarine Studies. He knows thoroughly the field to be explored by this panel. We appreciate very much his accepting the responsibility of moderator for this symposium, and he will introduce the members of the panel. I will now turn over the chair to Dr. Earl Finbar Murphy.

(*Dr. Murphy*) Every generation has had to come to terms with what it regarded as the outstanding problem in the field of water pollution. A hundred years ago, the problem was the one of the water-borne epidemic diseases. Later, the problem became that of toxic quality of effluent in

receiving water bodies. Subsequently, the problem has moved on to the difficulty of using entire river systems as cooling agents and the problem of thermal pollution.

And now we have an even more vexing problem, that of the nutrient coming into the water in a completely potable effluent usable for industrial purposes which is nevertheless of considerable harm to the ecology of water systems.

It seems, in fact, that as we get one problem solved we find standing in back of that even more complex, vexing and dangerous problems than the ones we have already addressed ourselves to. As a matter of fact, it has sometimes been said that perhaps the solution of certain problems contributes to the severity of others. At a time when water was heavily laden with bacteria capable of generating explosive epidemics of typhoid and cholera, this seemed to keep under control such viral disorders as hepatitis. But with the removal of bacteria from the water, the way was cleared for the more subtle, certainly less dangerous, but nevertheless potentially very serious epidemics of the viral type.

This does not mean, of course, that we should not correct problems as we come upon them, as they seem to us to be serious, and as we have the means for their solution. But it does mean that probably even if this generation should succeed in solving all the problems which it sees before it, it would only have cleared the way for the development of problems for later generations.

Certainly, however, merely leaving gross pollutants in the water, while it may obscure, perhaps even postpone, or act as a barrier to other problems, is not in itself a form of solution.

I think that this panel today is as about as distinguished a panel of three people on the subject of water pollution as could have been gathered together.

Dr. Ruth Patrick, who is with the Academy of Natural Sciences here in Philadelphia, is probably one of the best known and best regarded limnologists in the United States. I recall vividly, when I served on the advisory panel of the Office of Water Resources Research, the director of that office said that his greatest regret was that there was no way to produce more Ruth Patricks out of the one that he had. If he could have three of her, he would be much further along towards the solution of his office's problems.

Dr. Gordon Wolman, who is chairman of the Department of Geography at The Johns Hopkins University, is one of the most highly regarded geologic geographers in the world. Again, he is one of these people who is in continuous demand. I'm quite sure that he would be the subject of that famous chair, which they speak of endowing, that would be on Pan American Airways, if he wished to indulge himself in accepting every invitation that he received.

Commissioner Samuel Baxter—well, all I can say is that the city of Philadelphia is extremely fortunate to have this man as its water commissioner. I know that when the moderator comes from the same city as a member of the panel, people have a tendency to dismiss what he has to say as local chauvinism. While I am a resident of Philadelphia, I am not a native of Philadelphia. Therefore, I think that I can view it with some objectivity. I can say quite objectively that Commissioner Baxter is one of the outstanding water officials in the world. I think that I have read enough of water problems in Europe and Asia and Latin America to be able to make that statement and, if pressed, to bring the evidence forward to sustain it.

You are extremely fortunate with the panel you have here today.

The way in which this meeting will operate is as follows: I'm going to call upon each of the three panelists to make a fifteen minute general statement, and I will then open the meeting to questions from

the floor. As you know, a number of questions were submitted in advance, about five single-spaced, typed pages of such questions, many of them of such a general breadth and scope that only a book could possibly answer them. We will try in our presentations to cover this material as thoroughly as possible. I will then open the discussion to questions from the floor. If anyone feels that any questions they have submitted have either not been dealt with or inadequately dealt with, he will have the opportunity to bring them up again. And then I will close the meeting by asking each of the panelists to give a five minute wrap-up of this morning's program as he sees it in its effectiveness.

I intend to follow the standard procedure of calling upon the lady first. Dr. Patrick, therefore, will open the meeting with her general remarks on the problem of the present session.

Ecology and Pollution

(*Dr. Patrick*) Thank you, Dr. Murphy.

I shall address myself to the general overall problem of ecology and pollution.

Since the nomads roamed the desert, today, and for a long time to come, man has been concerned in finding fresh water and enough of it. Today, water is often the central problem of legislative, governmental and industrial meetings.

Water means many things to many people. To some people, it is a lake on which to water-ski or sail; to others, it is a nice stream to fish in or perhaps just a pleasant place to walk beside. To some, it is a place to dispose of wastes.

When man worked from sun to sun, he had little time for recreation, but today recreation is the second largest industry in Pennsylvania. If it is not the second largest, it is certainly one of the larger industries in most of the states of our country. The result is that recreation itself is starting to produce its own pollution problems.

Now, as I said before, water has meant many things to many people. It has always been directly or indirectly a source of power for civilization. But in spite of the fact that the water means so much, few people have looked beneath its surface to see how this water world functions, and how water is cleansed and rejuvenated and made fit for multipurpose use.

As in the terrestrial world, there are many kinds of organisms functioning in an ecosystem which has four or five stages of energy transfer. We have the decomposers, the bacteria which take the organic matter and break it down into simple forms which can be utilized for food by the algae. The algae are the aquatic plants. They take the nitrates and the phosphates produced by the bacteria and convert these chemicals into protoplasm or food for other organisms in the aquatic world. Also, by the process of photosynthesis, they fix the sun's energy and produce oxygen. By this means they replace the oxygen in the water that has been used for respiration by the bacteria, animals and plants. These algae and bacteria would become too numerous if it were not for the predators that feed upon them. For example, the protozoa feed upon the bacteria and thus control the population sizes of these organisms.

The bacteria produce auto-toxins and the auto-toxins would kill the bacteria if their populations got too large. But the protozoa feeding upon them keep them in balance. Likewise, we would have too many algae if we didn't have the organisms preying upon them, and in a similar manner we would have too many herbivores or algae feeders if we didn't have the carnivores.

Thus, you see in every aquatic system we have a steady state system, a highly integrated system, each group depending upon each other in a definite predator-prey relationship.

I like to compare this system to a sym-

phony orchestra in which we have many instruments, each one playing its part. Each one must be played with the right volume if the symphony is going to be complete. If any instrument drops out, if any instrument overplays its part, the symphony is harmed, if not destroyed.

And so with the functioning of this aquatic ecosystem. We must have it functioning correctly, that is, many species must be present with moderate-sized populations performing various functions. You rarely see nuisance growths or large sludge beds in a natural healthy system, because the transfer of energy is compatible with the production of the system. For example, certain energy molecules are fixed into algae, and through decomposition when the algae die they become food for the fungi and the bacteria that are the decomposers. Other molecules of energy are passed on from the primary producers, the algae, to the herbivores and in turn to the carnivores. At each level, some energy is through decomposition by the bacteria and fungi returned for recycling. And so we have a pattern of the cycling of energy just as we have a pattern of the aquatic organisms performing various functions.

Now it is interesting to note that in each level in this food web we have many different kinds of organisms. That is to say, we have fish, we have insects, and we have aquatic invertebrates that function as herbivores. And likewise, we have a great diversity of organisms that function as carnivores. This aquatic ecosystem has many food paths, and the web is complex. This gives it great stability.

We know that in natural systems we have a great many different kinds of species performing each one of these functions in these four or five stages of the food web.

One of the first effects of pollution is to cause certain of the species to become too common.

Too large a population of one or several species is the first sign of degradation of the system. As degradation proceeds, we have a loss of species. The result is often a few species that are not suitable food sources, and fixed energy increases in the system. When the energy is being cycled in the correct manner, there is high predator pressure, there is no pile-up of fixed energy in any one group, and, therefore, there are no nuisance growths.

Often pollution produces imbalances of nutrients, and fixed energy accumulates in groups of species that have low predator pressure, because they are not a good source of food. And so as pollution proceeds, we finally have the natural system completely destroyed. This is what happens when pollution is too severe.

The kinds of pollutants that affect this aquatic ecosystem that is so necessary for water re-use may be classified into roughly four groups: pollutants that cause suspended solids, pollutants that produce toxic effects, pollutants which are an organic load in the system and pollutants that cause heat or temperature changes that are undesirable.

The first effect that we usually associate with suspended solid loads is that they cut out light. Light is necessary for photosynthesis. Algae are the grasses of the sea or the river or the lake, and, therefore, anything that cuts down light cuts down the algae which are the base of the food supply. As a result, there are fewer aquatic organisms. Fewer algae reduce the oxygen production and the regeneration of the system. And so, suspended solids, by reducing light, reduce the productivity of the system.

Another effect of the suspended solid load is that it may gradually settle out of solution. I often compare this gradual settling to a continuous snowfall. It clogs up the habitats and destroys the heterogeneity of the system and reduces the numbers of the species that can live in an area.

Other smaller particles of the suspended solid load we call colloids. Now these sub-

stances have electrically-active surfaces. They may absorb onto their surfaces nutrients and thus act as reservoirs of nutrients in waters that may by chemical tests appear to be relatively poor in nutrients. Thus, colloids may act as reservoirs of nutrients and make a given body of water more productive than it would appear to be from the nutrients in solution.

On the other hand, these colloids may also function to adsorb metals or radioactive materials. As a result, chemical tests made at the point of discharge may not indicate the total available concentrations of heavy metals or radioactive materials. For example in the Savannah River, it is where fresh water meets salt water that colloids are coagulated and settled out of solution. It is here that one finds small amounts of radioactive metals introduced into the river many miles upstream. And so, these colloids of the suspended solid load may greatly alter the nutrient picture, and waters containing them may be richer in nutrients than analyses of the soluble chemicals would indicate.

Toxic materials are another group of pollutants. A toxic substance may kill an individual outright. This is easy to identify. But more difficult to identify are those toxic materials which in very small amounts produce chronic effects or those toxic materials that are only slightly toxic but nevertheless produce such chronic effects.

Recently we have been carrying out some experiments in our laboratories that have shown that some organic chemical toxins in very small amounts affect the breeding behavior of fish, causing the male fish to fail to chase the female or to stake out the nesting site. These latter types of toxicants which affect the behavior and metabolism of fish, though they do not immediately kill the individual, in the long run will eliminate the species.

Organic pollution arises from many sources, such as the sewage treatment plants. It may also arise from cattle and feed lots. When one realizes that a single head of cattle has a pollution equivalent of 16.9 human beings in nitrates and phosphates, one can appreciate why there are often severe pollution problems on small farm streams. Today, particularly in the midwest but often in the east, one sees as many as three to five hundred head of cattle per acre. Thus, a stream may be severely harmed in its headwaters and never have a chance to recover.

Organic pollution is one of our most insidious kinds of pollution, because our usual methods of treatment of sewage produce a mineralized affluent rich in nitrates and phosphates. If the concentrations of these nitrates and phosphates are imbalanced or too high, they bring about the production of algae such as *Cladophora, Stigeoclonium* and blue-green algae that have low nutrient value. Practically nothing feeds on them. As a result, they pile up in our streams and become nuisance growths. Also, they lock up the nutrients and destroy the pattern of cycling of nutrients that I talked about earlier.

Temperature may have many effects upon aquatic life. We know that if the temperature in the temperate zone goes much above 90 to 93 degrees Fahrenheit, many species of plants and animals in an ecosystem are destroyed. Too high temperatures can be destructive.

A change of temperature is also a necessity. For instance, in Maryand, temperatures of waters have to rise in the spring from below 60 to above 65 in order for bass to spawn. Oysters on the Atlantic coast will not spawn unless the water passes from the mid-60's to the high 60's or low 70's. Natural rhythmic temperature changes must take place for normal reproduction.

As we consider these various kinds of pollution, we find out that perturbation produced by pollution may greatly alter the efficiency of the natural aquatic system. Perhaps the most severe effect of per-

turbation is the long-range effect which results in a great reduction in the diversity of species composing man's environment. Such reduction limits the flexibility of aquatic communities to adjust to changing conditions. Once this flexibility is destroyed, it is extremely difficult to restore it.

As we look into the future, it is evident that man, water and air are one world and that we are going to have more and more people working shorter and shorter periods of time. This means that man is going to demand more and more from the surface waters for recreational use and at the same time demand more material things for his way of life.

Our first challenge on a nation-wide or world-wide basis is to improve our methods of manufacturing so that waste products are greatly reduced. Our second challenge is to re-use water and solid wastes more effectively. Today, we are a once-through nation, but tomorrow we must become a re-use nation. Disposal at sea and underground are, in the long run, only temporary measures.

We must also, I believe, attack the pollution problem in quite another way. We should realize the fact that probably all pollution will not be removed from our lakes and streams even though mankind does all he can to prevent pollution from entering them.

Realizing this fact, we must learn to plan the use of our watersheds. We must learn that certain areas must be kept for recreation and others for regeneration (as breeding grounds and reservoirs of species). These areas are essential if our environment, over time, is going to meet its challenges.

Likewise, industry and waste disposal plants should be located so that they may supplement or complement each other. Once we have reduced the wasteload as much as we can, we must plan use so we do not have abuse of our waterways. In areas of heavy usage, we must learn how to manage streams so that they will produce the kinds of species we desire and the pattern of energy and/or nutrient flow that will promote stability.

It is well known that the agriculturist or the horticulturist conducts a soil test and adds nutrients to the soil to balance nutrients so that he can grow what he wants. It seems to me that the same philosophy may be followed in the management of our surface waters, and one day to our sewage affluence we may add a bit of molybdenum or vitamin B_{12} or something else to promote the growth of diatoms, which are an excellent source of food, and make the whole system more productive, rather than have a pile-up of blue-green algae and nuisance growths which then are an unsightly mess and destroy the productivity of the system.

I think also we are going to have to "architect" our streams in areas of heavy usage. We have to learn what are the characteristics that desirable species require. Perhaps we will actually "architect" the Delaware, for example, through the city of Philadelphia to produce shallow water areas and the right kinds of substrates which will promote suitable conditions for shad to go up and down the Delaware.

I often say that we are using our streams today as we used land when the pioneer first came to this country. He shot his game, he picked the berries from the field, and he obtained a livelihood. But when man became more numerous and settled down, he had to cultivate and structure his land and manage it. Now management costs are expensive, and certainly we would not want to manage any watershed completely, but there are areas of the watershed where management may be the solution.

I believe that the ingenuity of man will find ways to have the use without abuse of our surface waters. However, man must come face to face with what he wants for

his material way of life, and what is the price that he is willing to pay for good water.

(*Mr. Murphy*) I think you have just seen an example of what Dr. Roland Renne was talking about when he said that he wished there were more Ruth Patricks. She has the marvelous ability to give a summary of the state of the art in a highly technical field in which very few laymen have even an elementary instruction and make it at least appear understandable to laymen. Whether we know the art as well as we think we do after hearing Dr. Patrick I rather doubt, but we know more than we did before.

Our next speaker is Commissioner Baxter. Before I introduce him, I should like to tell about an advertisement that appeared in a number of publications about a year ago. The question of the advertisement was basically this: "Would a surgeon wash his hands in sewage effluent?" The answer is: "Of course, when there isn't anything else to wash his hands in."

And there is no particular reason why he ought not to wash his hands in sewage effluent if the municipal commissioner of water has done his job properly.

I think it is the good fortune of Philadelphia to have a commissioner of water who in my opinion has turned Philadelphia water from a vaudeville joke into as potable a water supply as most cities in the United States have. I'm a little prejudiced because I come from the midwest. Philadelphians ask, "Do you really like the water here?" I have to admit that it is quite an improvement.

I recall a little item in my hometown newspaper. It said that citizens had been complaining lately about the water, but that this was because they did not know how to handle it. The paper suggested that they chill it and before serving add a pinch of salt and alum, after which they would find the water as appetizing as water anywhere in the world.

But we don't have to do that in Philadelphia because of Commissioner Baxter. So I therefore give you Commissioner Baxter, our next speaker.

Practical Problems in Pollution

(*Commissioner Baxter*) I hasten to warn all of the doctors in the audience not to take the effluent from our sewage plant to wash their hands before they perform operations. But on the other hand, I go back to this interesting fact. Some 25 years ago, I was working down in the new town of Oak Ridge where we were throwing things together quite quickly for the people who came there, many of whom were top level scientists who were much interested when they came to the backwoods Tennessee town as to what the living conditions were. Because of geography and many other things, the water treatment plant on the Clinch River was three miles downstream from the sewage treatment plant. Now that sounds like poor engineering, but nevertheless it was a fact. And some of the people coming in found that out. I used to have to take them down to that sewage treatment plant and show them how thoroughly the plant was built. But before I went down with each group of them, I so thoroughly chlorinated that effluent that nothing would live in it. And I used to drink it to show them how good it was. I still wonder what that chlorine did to my insides.

As you have heard from Dr. Patrick, many, many able people have been searching nature to find out what goes on in this field of water and related matters.

But somebody has to take water as of today, as of 10 o'clock this morning, take what is available and turn it out so that people can use it as potable water, so that people can use it for industry. And someone also has to take the water after people have used it for industry and regular purposes and dispose of it in some way.

This is the field in which I work. Delay

isn't possible. Laboratory scientists can look at a problem, and, if today it is not solved, tomorrow work on it again, and next week, and eventually find a solution. But I can tell you this, that I cannot do this, and there are dozens or hundreds of other operating people like myself. I cannot this morning decide that something has happened in the water field or in our sewage treatment plants and say, "Well, I'm going to turn it off and wait until I find out what I can do with it."

This morning water has to run; every day it has to run so that it is delivered to your taps. And, incidentally, we have no choice about the waste water. You put it in the sewer and we get it, and we have to do something with it every day.

Now this gets to be a pretty practical thing for those of us who do this. It sometimes seems as if, in terms of the waste water, we are nothing but dirty polluters, that we don't care too much, that we just throw it back into the river.

Now let me take you back to 1799 to show how these things work. 1799 was the year that Philadelphians decided to build their first water treatment plant and they had to make a choice between two rivers. Now there was no knowledge of bacteria theory at that time. There were no laboratories. But someone had to decide whether to use the Schuylkill River or the Delaware River for a public water supply.

The records show clearly that they did think about this particular subject and that the Schuylkill River was chosen at that time. Incidentally, the decision has fluctuated back and forth in the last 160 years as to which river we should use. But the Schuylkill was chosen at that time because the Delaware apparently, at least in that particular year, had more decayed vegetation in it and, therefore, had more of a musty taste.

Now as time went on, new things developed and the men who had to turn out water for the citizens of Philadelphia used the knowledge that scientists had developed in order to turn out better water. Of course, they used the new engineering knowledge which had been developed.

For a while, nothing was done except sedimentation. If we let water sit in a reservoir or someplace for a couple of days, some of the solids that are in it will settle out. They did not realize, even in that beginning time, that in taking out just plain dirt they were taking some other things out that were harmful.

And then as the years came along around the turn of the century, filtration was used as a treatment process. Later (in Philadelphia, about ten years later), chlorination came along.

In the last ten or fifteen years, many people around the country have shown a real interest in the problem of pollution, much of it since World War II and most of it since the enactment of the first pollution act in 1956 by the Federal government. But those of you who are younger or fairly new to the subject must not forget that people have been working on this for many, many years. For example, one of the real landmarks in work on river pollution (particularly pollution in an estuary) was done here in Philadelphia by predecessors of mine between 1909 and 1914. That report shows some real wonderful knowledge. Every last bit of scientific knowledge that was available in laboratories was applied to that study, and it was the beginning of treatment of waste and sewage in Philadelphia. So there have been people in this city who have been working actively on the subject for almost 60 years, with progress being made. When I use the term Johnny-come-lately, I do not mean to use it offensively to people who have come recently into this field. But many, many people have worked on this for a long time, and my first contact with it goes back 35 years.

Now why is it such an important problem? Why has it taken the size and magni-

tude that it now appears to take? Well, here we are living in the Philadelphia metropolitan area with perhaps six or seven million people on the Delaware River and on its tributaries (depending on how you count them). Most of them depend either on the rivers themselves or on underground sources that are somewhat related to the river.

Three hundred years ago there may have been 30- to 60,000 Indians scattered all over the place. That was all. They lived in small villages around the whole area. They did not concentrate themselves. Now we find five or six million people wanting water that is pure. They want to make sure that there are no bacteria in it that are going to make them sick. They are now beginning to be concerned about any virus that might give them some kind of pain. They want the river clean enough for swimming. (I do not know whether the Indians did go swimming; I doubt if they went bathing, although, they might have swum for recreation.) We now want to be able to ride in boats for recreational purposes. We even want fishing for recreation, which was not a factor at all three or four hundred years ago. The only interest in fish at that time was for food. Now we want to be able to catch them. Not being a fisherman, I can suggest that some people want to keep the fish alive only so that they can kill them—but that is one individual's viewpoint.

What happens to those people—and obviously I am talking now from the standpoint of one who must day by day face this problem—and what do we do? Are we interested in only the simple problem of producing water? Do we do any other thinking? Most of the people active in this field like to think that they do some research, not as basic, perhaps, as Dr. Patrick indicated, but at least research in the terms of applied research. I know that we do it here in our own utility in Philadelphia.

We learn fairly fast that we have to become economists, or at least amateur economists, and now and then you will find that we even talk like philosophers, or at least we think that we do.

Our subject here this morning is survival as related to water. I think that in so many things—and here I am becoming sort of an amateur scientist—man has shown that he reacts to whatever happens and in some way overcomes any kind of problem that faces him. Even the problems that would destroy him or the problems that would in some way restrict his way of living are solved in some manner. At times, we may let the particular troublesome problem get so acute that it needs a major operation in order to cure it. Perhaps in some cases, parts of the world itself may even die before we can do anything about it. But in the long run, man nearly always comes through and is able to survive.

If that sounds like a negative approach to this problem, it isn't. It's the positive approach. I am saying that, whatever our problem is, we have people who are going to react to it and are going to find the solutions that will make it possible for us to continue to live in our metropolitan areas and to live on this planet. If that is the case, why is pollution such a problem? Why is it a number one problem (as was said to me in another seminar in which I participated, where I challenged the statement that pollution is a number one problem in this country, even though we have such a meeting as this one today)?

I did not hear very much during the last national election period about water pollution as a national problem. There was some mention of it, but there were other things that we were thinking about and that were part of the overall debates in our political contest.

Pollution is a problem, but I doubt that it is the number one problem, and I shall give you an idea why I think that this is

so. It relates to our work here this morning. If you read the newspapers in Philadelphia, if you sit in the offices of the commissioners that operate the various departpartments, and, I presume, if you sit in the office of the mayor, I think you will find that there are untold numbers of requests that something be done about crime in the streets, that something be done about poverty and people who do not have enough to live on properly in terms of food and in terms of shelter. We hear much about the fact that housing is poor and that something should be done about it. But very few citizens of the city or of this area complain about pollution in the Delaware River.

And what we do about these things, what we do about correcting them, most times is based upon how many complaints we have about them, as well as the magnitude of other problems.

I was criticized for making the little statement or phrase a couple of years ago that the problem was "fish in the river or kids in school," and I want to explain it here as an indication of what this particular problem is. I do not have to tell Philadelphians that there is a need for millions and millions of dollars for the construction of new schools, renovation of old schools, and increased salaries for teachers. We have real problems trying to find the money to do these things.

This is perhaps where the engineer starts to wear his economist hat and to suggest that there are priorities which we should place upon all of these things. As an engineer, I can tell you, and I believe this, that if I had enough money I could make the Delaware River and the Schuylkill River almost as clean as it was when the Indians were here. Not quite so clean as Dr. Patrick indicated, but it could be done. I do not know what the cost would be, but most engineers will tell you that they can build any kind of structure as long as they have enough time and enough money to do it.

But there certainly is a limit to how much money we have, which is another way of saying how much effort we want to put into things. And this is why we have to face the matter of pollution and water supply in the light of the needs of other community facilities.

Let me point out that in most cities in the country, in spite of what some scare articles in lay magazines say, you find potable water. In some cases it may have a taste that you do not like and in other cases it may be harder or softer than you like, but you find potable water.

Even in the case of the midwestern city to which Dr. Murphy referred, it would have taken only a small amount of money for that community to correct whatever was the situation that caused poor water. The citizens in that community apparently decided that they did not want to put that particular amount of money into that system.

For example, in Philadelphia 25 or 35 years ago, we had water which was described as a chlorine cocktail. It was laughed about all over the country. Do you know why that was? It was not because the men (and I can say that 35 years ago I was not directly connected with water supply, so I do not have to apologize) at that time did not know what to do about it. The real reason was that you people, or your predecessors, did not want to put enough money into the water system to build the facilities that were needed. That was why we had bad-tasting water at that time. The reason that it is better today is that you have been willing to pay the necessary amount of money so that we can build a modern waterworks.

I think that this is what must happen if we want to clean up our rivers.

I should like to point out to you that new standards have been promulgated for the Delaware River and other rivers in

this area. It is going to cost the people in Philadelphia at least $100,000,000 in capital money to build the necessary structures to meet these standards. You are going to pay for it by means of increased sewer rents or you are going to pay for it in national taxes which will vary with the amount of Federal grants. But you are going to pay perhaps twice the amount which we now pay in order to operate the new plants.

In the same way that you obtained better water here and better water in other cities by being willing to pay for it, I am going to suggest that, if you are willing to pay 50% more in your sewer rent charges, we can do something about improving river conditions.

I would hope and suggest that the organizations which are sponsors of the symposium this morning would be the ones that would be out front saying we support the increase taxes or, in our case in Philadelphia, that we support the very decided increase in sewer rents in order to have a Delaware River that is cleaner than it now is. Perhaps the only improvement that we will get will be an increase in the amount of fish that can live in the river. Later this morning I am sure that we will have to debate this item with the audience, Dr. Murphy.

(*Dr. Murphy*) Lord John Russell once said that water pollution was the minor concern of a minor department. Unfortunately, this has been traditionally the case.

I was on a lecture tour this past month on regulation of the environment. I went among some small colleges in the plains states, and I found a singular lack of interest in the subject. When I was discussing it with a college official, I said, "What would I have to talk about to get the students interested? Sex and drugs?"

"Oh, no, no, no," he said. "They're not talking about them anymore. They're doing them."

"Well," I said, "have you a topic to suggest?"

"Yes," he said, "something like the coming world revolution—but don't get too detailed."

So I think that we have to bear in mind that the hard economic problems are the ones upon which we generally wreck our noble craft.

For example, in 1931 the city of New York projected a shore patrol program meant to produce by 1991 a very fine system of water conditions along the shores of the many boroughs of New York City. This program has almost consistently been postponed or starved. When one bears in mind that, for example, since 1952 there has been an almost explosive growth of public relief expenditures (so that today one out of every eight persons in New York City receives some form of assistance from the city and that this has been a five-fold growth since 1951), I think that you can begin to see why there might be problems in that city about replacing water mains (even though they lose by leakage at least 15% of the water coming into the city), or in putting in sewage treatment plants, or in financing shore control programs, or matters of this kind.

And I think that we owe Commissioner Baxter a vote of thanks that he has brought these matters to our attention, because it is in this hard area that the problems will lie.

I now want to call upon Dr. Gordon Wolman. I first met Dr. Wolman while serving on the advisory panel of the Office of Water Resources Research, a most interesting group of people which changes every year. We are no longer on the panel. They have a policy that they never re-appoint anybody, and I think that might be good. At any rate, it brings a new view to the administrators.

I would like, therefore, to call upon Dr. Wolman to talk to us about the problem of water pollution and survival.

Perception, Value and Conflict Resolution in Water Pollution

(*Dr. Wolman*) Thank you, Dr. Murphy. While I was not informed about the character of this session and learned only a moment ago that it is non-political, I shall talk about the coming world revolution, previously noted, but in not too much detail. First, because the session is non-political, I agree with everything said before. I am concerned for the taxpayer, as Mr. Baxter is, and I am particularly concerned for the fish who is apparently being deterred from chasing his lady. This ready agreement is not entirely out of place, as I hope to be able to demonstrate that a significant part of the so-called "water problem" lies in the disparate points of view or values placed upon water by different viewers.

Risking sins of both omission and commission, I should like at the outset to focus upon the three major topics. They constitute a kind of thumbnail evaluation of some of the current issues in the field of water resources and water pollution. (To the extent that these flat-footed statements get me into hot water, I reserve the privilege of later withdrawal on the grounds that in such joint discourse there may be value in provocation derived from over simplification.)

The three concepts are: perception, value, and conflict resolution. They are clearly not new. Earlier, Dr. Woods in his introduction pointed out that the issues in every public question are what is it, how big is it, who thinks what it is, and what are we going to do about it. The three points I have chosen to emphasize are in fact these issues simply couched in the jargon of today.

I use "perception" particularly rather than "what are the facts," because the issues are in part dependent upon who is looking at the facts, as much as upon what the facts may be as defined by specialized observers. To illustrate what I would call the problem of perception in the environment, I quote from the *New Yorker* what is described as a post-vacation dialogue between two secretaries:

"But you get so tired with nothing but scenery all the time."

"Yes, but you get even more tired and bored without any scenery."

"Well I guess, but I like it better when there is mostly landscape and not so much scenery."

"Well, I guess, but most of the scenery was gone when we were there; there were just mountains and things."

As it is clear that there is scenery, and there is landscape, and there are mountains and things, so there is water, and there are a variety of facts about it. Some, facts, mere facts; still others, simple facts. Let me examine a few.

I do not believe that we have a problem of water quantity in the United States. The United States has about five times as much water available as run-off than is currently being withdrawn for use, and I do not mean used up or consumed but withdrawn from streams. It may not be distributed at the moment as we would like it, but the supply is there. The quantity problem, then, is one of distribution. We have the mechanical means for this distribution and I will come later to what I think some of the distributional problems are. They are not deficits in supply.

On the other hand, I believe we do have problems of quality and it is to these that attention has been drawn today. I do not, however, subscribe to the classic quotation occasionally used to characterize the state of our water resources, that is, "Water, water everwhere, but nary a drop to drink." It is catchy, but not easily supported. As Mr. Baxter has said, we do know how to treat water for drinking purposes. This, however, is no longer con-

sidered sufficient. We have been progressively changing our perception, our concept, if you will, of what the water resource is and what we want from it.

We do not, for example, really know what water quality was in many river courses in Indian times. This can of course lead to considerable confusion when we consider such issues as cleaning up the Potomac River in the estuary near Washington. As far as we can tell, when John Smith floated up the Potomac River, he found a shallow river with much silt and mud near the shore. The records are clear in showing that from George Washington's time travelers in the area (including boatsmen of the Royal Navy which ran aground in the Potomac River in 1812) noted that sediment derived from intensive farming very early in our colonial history posed tremendous problems. Dredging in the Potomac began about 1805 and has continued unabated into the present, and, as far as we can tell, will go on into the future for some time.

The answer to the question, then, of what is polluted depends, I think, upon the kinds of values being sought. Thus, it is difficult to envision a day when we will have a pristine, blue Potomac River, because we are not sure how to create one, nor, as a matter of fact, are we sure that having one would be a good thing.

It is equally true that some other rivers, such as the Ohio, are probably considerably improved in the present day over their recent past. The Ohio has been the scene of the nation's most impressive improvement program. This successful effort has been directed by the Ohio River Sanitary Commission, a complex, eight-state organization with very limited power. This improvement was gained from a considerable expenditure in real dollars and in energy. Nevertheless, many people have still further dreams and desires, quite rightful ones, for the Ohio and for other rivers. They require of them now and in the future something quite different from what was thought when the initial clean-up began.

While every appraiser might rank them differently, I believe that several general problems of water quality can be distinguished. Ranking problems in the order of importance suggested here is at best a quantitative judgement. First, perhaps, are problems of biological wastes. It has been estimated that to keep up with present population growth and to make up for some backlog will require annual expenditures for waste treatment plants in the United States on the order of 2.5 to 3 billion dollars a year, assuming an effort to live up to quality standards currently being developed. Quite clearly, without treatment, progressive increase in organic and inorganic wastes in natural waters will produce severe degradation in their biological, chemical and physical quality.

A gradual increase in salt content, mostly sodium chloride, in streams presents a second area of concern. The distribution of the problem, is, of course, spotty. In the western United States, for example on the Colorado River, a national and international issue concerns increasing salt content of the Colorado River. While the United States is committed by treaty to deliver a given quantity of water, special attention is increasingly required to assure that the salinity does not become excessive. Much of the increased salinity in regions of irrigated agriculture derives from the return to stream flow of irrigation water. Elsewhere industrial water used for cleaning and for cooling will produce an increase in salt concentration.

At present, it is estimated that the average salt content of the rivers in the United States is a mere 20 parts per million. (Because it masks regional variability, such an average is of course only useful in giving a rough order of magnitude.) This figure is indeed low. Figures as high as several thousand p.p.m. have

been noted for the Colorado. And for the United States as a whole, by making heroic assumptions about population and industrial growth (a hazardous practice), one can arrive at figures of several hundred to several thousand parts per million by the year 2050. While the actual estimates are meaningless, a rising level of salts poses a number of problems of management, particularly where efforts will be made to operate in relatively closed systems.

A third problem of quality of potential concern is heat. Because cooling constitutes a major use of water, increases in water temperatures pose industrial treatment problems as well as ecological problems in the water courses themselves. Large electric power generating stations, particularly the nuclear ones, produce at a heat efficiency of about 30% which means that roughly for each unit of electric energy produced two units of heat are returned to the environment either into the water or into the air. The number of large plants is increasing, which in turn demands a better understanding of the behavior and effect of heat in the water environment. At present, such knowledge is severely limited.

The expansion of city and suburb in themselves creates new issues of water quality brought about by changes in land use. Contrary to the hopes of many, limited data available thus far show that water which runs off of streets is not very clean. Indeed, after treatment of sanitary sewage one may still be faced with considerable pollution problems related to the organic, inorganic and chemical wastes which flow from the drainage system. Again, precise knowledge is limited about the nature and amount of these products. They can, of course, be trapped and treated, but in many major metropolitan areas this would require expenditures of upwards of many millions of dollars, not to speak of extraordinary dislocations. A wide variety of new industrial products also create demands upon treatment facilities and receiving bodies. Unlike runoff, however, they do not pose the same problems of collection even though they may pose technological problems in treatment.

Lastly, attention should be drawn to the large quantities of silt derived both from agricultural land and, more recently, from suburban areas where construction is under way. Metropolitan areas are of especial interest inasmuch as it is in these areas that people are concentrated and concern for adjacent water bodies greatest. Thus, many of the rivers which are ostensibly polluted from head to toe are in fact not polluted from head to toe at all, but rather, like the Potomac, they are polluted at specific urban places. Unfortunately, one of two locations on the Potomac is the nation's capital, an area populated by three million people with an expected six million foreseen for the near future. Through much of its length, the Potomac River is in quite good shape. My friends contest this because it appears that, wherever they fish, it turns out to be in a sewer effluent. Nonetheless, the number of these is limited and being reduced.

However, the silt load in the urban environment can be very large, and in cities such as Baltimore, Washington, Philadelphia, Norfolk, or Richmond, along the Fall Line, sediment from construction can be expected to accumulate in the estuary where it is least wanted. Some have suggested that if silt is settled out, increased light penetration will cause Dr. Patrick's algae to blossom and that we might better have silt. I don't know whether this is true or not. I wish you would ask Dr. Patrick.

These then are some rankings of problems of pollution, my perception of some of the facts. They are clearly my own and thus far deal only indirectly with the lady fish. She has her special champions as will become evident.

A second focus of consideration is the question of value. We all have different

values, arrived at in different ways. These diverse values have different "constituents," if you will, two facts of major importance in viewing the problems of water management. The importance people attach to various aspects of water is not only varied but the strength of their convictions also varies. Thus, while almost everybody would say that we are all concerned about our health, we behave in fact quite differently. Indeed, it appears that most people are not concerned about their health until they are sick, and so it is with environmental concerns.

We are particularly concerned with the Delaware River, for example, when it is in flood. If it's been low for a few years, you cannot interest anyone in even buying a gaging station for $2,000 a year or in putting up a flood wall or warning system. Historically, expenditures for flood control are nicely correlated with floods, as is planning for water supply with incidence of drought. Where environment and health are concerned, the same is true. Fifty or sixty cases of typhoid per hundred thousand in the cities provided a good argument for doing something about water supply, even though dust and fire rates might have in fact been the more persuasive arguments, as Mr. Baxter noted earlier. At any rate, these incentives assured progress toward water treatment.

In the face of new interests such as recreation and wildlife, the reiteration of health hazards to man may become something of an albatross. These are not the halls in which to say so, but thus far good epidemiologic evidence of significant health problems associated with open water bathing in large bodies of water such as major rivers or our coastal areas, even though these may show relatively high levels of pollution, has not been demonstrated. Such waters including waste solids are aesthetically unpleasing, and apparently most people will stay out before they will all get ill. British medical studies that have reviewed the evidence suggest that the desire for clean water in many of our larger bodies of water cannot be hinged upon the health hazard, as many would like to argue.

We have turned, then, to other objectives, such as, fishing, boating, water-skiing, swimming and looking. Here different values must and do conflict. There is a recent study of people's attitudes toward a number of lakes in Ohio which illustrates this conflict in values. Questionnaires were used to sample the preferences of people among a number of small lakes to determine those most, least, etc., used. Of interest here is the fact that one whole group of people exclusively preferred a particular deep, blue lake. Another group considered the deep blue lake the worst of the choices and chose instead a delightful bullfrog, bass, trout, reedy lake. The different values of these two groups are certainly recognizable, but the rationale and the causes of the lake condition are ironic. The "nice" blue lake was receiving an inflow of acid mine drainage and virtually everything in the lake was dead. The color was blue because of the mixture of the acid mine waste and the limestone terrain, yet for some this environment was perfect.

Perfect for what? It was perfect for water skiing. There was nothing to foul up the boats or the skiis and the only constraint expressed was the pH should not be so low that a skier would burn when he fell into the water.

Obviously no fishermen would go near the place. They chose other lakes, lakes chock full of life. Fishing and water-skiing, bird watching and motorboating are incompatible. The conflict in values is probably irreconcilable in a given place, and clearly the requisite standards for one are not necessarily appropriate to the other.

On a far larger scale, a comparable con-

flict is evident on the Colorado River where those who feel that it is virtually important to build some large reservoirs at the remaining sites on the Colorado River are opposed by those who feel that this would desecrate a unique natural area. That rather explicit values are involved in this controversy is suggested by the poetic verse which accompanied a stunning picture of Lake Powell behind Glen Canyon Dam on the Colorado River. The color photographic brochure was published by the Bureau of Reclamation and the philosophic caption reads, "To have a deep blue lake where no lake was before seems to bring man a little closer to God."

Now, that is the Bureau of Reclamation's view, a view certainly not shared by the Sierra Club. While the point may seem facetious, I believe that when we talk water management and even survival, it must be kept in mind that many of our views derive from a variety of values which in turn owe their origin to complex philosophic and historic precedents. Self evident rights and wrongs become difficult to discern. For these and additional reasons noted below, the problem of conflict resolution becomes important.

Conflicts arise not simply from differences in perceptions and values; these might be satisfied separately, were it not for the fact that they occur within an interconnected system. Thus, a fisherman on the Delaware who is not a Philadelphian is much dependent upon the willingness of the citizens of Philadelphia to spend money on a sewage treatment plant which may be viewed by many of them as having scant value because they are not fishermen. Because the water system is a unit, physical, chemical and biological phenomena are inter-related throughout an entire drainage basin. How one dams, dumps or deposits on the Susquehanna River in Pennsylvania will have a profound effect on the Chesapeake Bay in Maryland and Virginia. It is not possible to clean up the Potomac at Washington unless something can be done with land as much as 250 miles away.

It is impossible, in fact, to clean up a river, such as the Delaware, without a complex set of arrangements involving those who put wastes into the river, those who process the wastes, and those who use and process the water. Machinery must be established which is cognizant of these inter-relations if water control and management is to be rational, and indeed, if it is to succeed. Thus, one of the most vital areas of water concern is not only the unanswered technical problems; these are severe both because of the immense amounts of money involved as well as the possible significance of the consequences, but the institutional framework within which society can consider alternative ways of achieving these values and explore the consequences of its alternative choices. Current practice often provides the public with few or no alternatives, although at the national and regional level some efforts are being made in this direction. This mix is again nicely illustrated on the Potomac. If the Potomac is to be made "swimmable" by 1975 as has been suggested by some Federal officials, it may require alteration of the storm drainage as well as the sanitary sewers and treatment plants of the city of Washington. It will require control of sediments from the watershed, and it will require from biologists like Dr. Patrick an ability to predict whether or not, after we have made these expenditures, we will have more or less algae in the environment. The economic as well as the biologic stakes are high. Treatment plants and separation of storm and sanitary sewers might run to two billion dollars or more. To say the least, such expenditures would be extravagant if they failed to achieve the objective. Information is needed to predict with a higher degree of accuracy than we

have thought necessary before the probable consequences of contemplated action. In a larger and more densely settled population, the actions of some must of necessity impinge upon the "territory" of others. Thus, while margins for error are less, at the same time the costs of doing things are greater.

There exists a number of significant problems related to water quality. Many of these pose complex scientific problems in themselves. At the same time, there is a known technology which in many instances could be applied and has not been. Nevertheless, it should also be recognized that in evaluating diverse opportunities in water management, there are among people vast differences in values and in objectives, and at present rather limited modes of considering choices, estimating consequences, and resolving conflicts.

Thank you.

(*Mr. Murphy*) The field of water pollution is one area where pouring oil on troubled water has the same effect as throwing kerosene on an open fire.

Questions

(*Mr. Murphy*) I am now going to open the meeting for questions from the floor.

Commissioner Baxter, what is the extent to which air pollution resulting from water pollution in the Society Hill section of Philadelphia may be the result of inadequate treatment of sewage effluent or of sewage waste coming directly into the Delaware without any treatment at all from such sources as slaughterhouses?

(*Commissioner Baxter*) There have been intercepting sewers and treatment plants to take care of wastes and carry them on to the treatment plant. This has been provided by the city services. At the same time that the city has been required to do this by the State Department of Health, every industry along the river has been required to treat their industrial wastes. Therefore, if any wastes are going to the river, as has been suggested by the questioner, it is either accidental or "accidentally on purpose," which occasionally happens.

Now, there is a second factor involved in this, and that is that Philadelphia, like some eight or nine hundred other cities throughout the country, most of them in the eastern seaboard or along rivers like the Ohio and the Mississippi, have combined sewers. These combined sewers were built long before we had any knowledge of sewage treatment plants, or the fancy name we now use, water pollution control plants. This is a case where cities and people who built sewers ahead of time are now paying something of a penalty. These sewers are large enough so that, when we have rain storms, no sewage plant is big enough to take care of the flow and sewage combined with storm flow bypasses the plant into the river. This can put some waste into the river.

I have been associated with a research project that has just been completed for the Federal government which estimates that the cost of correcting this situation throughout the United States is somewhere between 17 and 45 billion dollars. Just for Philadelphia to correct it is somewhere between five and eight hundred million dollars.

In terms of air pollution, the only air pollution that I know coming from sewage in a river is the hydrogen sulfide that comes from deposits in the bottom of the river. This problem is a minor one today, compared to 25 years ago.

My own guess, and I've done a lot of work on it, is that today's sewage going into the river is not the real culprit. The real culprit is the many feet of sludge deposits that have been put into the river going back some 125 years since we first built sewers.

Dr. Patrick, what is currently being done to prepare an integrated plan that would

deal with the course of water pollution? What are the control measures that would protect the biota of streams from any kind of permanent ecologic interruption? What might be done to correct those factors in the future? Who will tackle the job—Federal, city, regional groups or some combination of these?

(*Dr. Patrick*) To start with, I might state that there are a number of watershed groups in this country, for instance, the Brandywine and Wissahickon groups. People are here representing a number of watershed groups. These are groups of citizens that have got together and expressed a concern about the management of their watershed. Usually they are advisory. They do not have the ability to act or enforce laws. They simply advise the state and then the state takes action, but they are an advisory group, an education group and they have done a good deal in many, many cases to stir up interest in the preserving and planning of the watersheds.

Then we have such groups as the Delaware Basin Commission, which is a group of the five governors and the Federal government as partners and they do have the ability to enforce laws and to plan what should be done in the Delaware Basin.

The Ohio Basin Commission, to which Dr. Wolman referred, is another group of this type. Unfortunately, there are not enough of these. Secretary Udall wants a great many more of these brought into action.

I think that this is the way that we are now tackling it. As Dr. Wolman pointed out, the institutions for interaction are relatively weak. This is certainly one of the fields where a great deal of time and energy and money should be spent.

I do feel that the future of the country depends on our plan. Too long we have been able to live and to do and to behave in any way we chose. We have to start to think and plan for the good of all in these resources.

(*Commissioner Baxter*) This is a partial answer to the question.

Some of you may know that about six weeks ago Congress enacted a law which set up a seven man commission and gave them five years to make a complete study of the entire problem of water resources in the United States including scientific, engineering, economic and social problems relating to water resources.

So if you can wait five years, whoever asked the question will get the answer. The reason that I comment on it here is that I happen to be one of the seven members of that commission. And over the next five years, assuming that I'm going to live that long, it's really going to be a wonderful experience to listen to all of the many viewpoints and all of the many scientific things and then to come up with an answer. The answer is not here today, I'm sure.

Is it wise to assign such a low priority to water pollution control measures because is it not possible that the destruction of the water resources quality may raise potential ecological dangers that outweigh any current pecuniary budgetary matters?

(*Dr. Patrick*) Yes is my answer. We have heard the problem of water pollution put in a wrong light today. It has been said that we have water pollution or we have children in school, either/or. And it has been said that we have plenty of water, so what?

I would like to point out that water is absolutely basic for civilization. We must have water, a good quality of water, if we are going to have a stable society. And a stable society means man without psychological problems. It means man must be able to recreate near his front door and not have to go away for the weekend. It

means man living with his home environment.

We must preserve man's environment. Man has the attitude that he can conquer the world, that anything that he wants is right. The more we look at the basic principles of life, the more we realize that man cannot do this. Man's psychology must change. He must learn how to live with the fundamental basic principles and laws of the environment. Only in that way can man be a fruitful, productive person with a great deal of ingenuity.

The former head of the School of Epidemiology at Yale told me not so long ago that they are finding very great differences in the incidence of diseases, both mental and physical diseases of man, if he is placed in an environment that is monotonously the same, with no differences, no change, with everything the same and man-made around him than if he is placed in a variable environment. Man has to have diversity. He has to have aesthetic, pleasing things in order to live. And these things are as important as educating children, because if they are all neurotics when they finish their education, what good are they? We must look at all aspects of the environment. We cannot separate one from the other.

(*Dr. Wolman*) I'll be very brief. Whenever I'm next to Dr. Patrick, I usually or almost always end up as an arrogant bulldozer operator.

I do not think I said, and I would like to be clear about this, what the relative priorities in the environment were, relative to, let us say, problems of war and peace or of population.

What I did say, and I think that this is important and does relate to Dr. Patrick's answer with which I would agree, was that we have to face a set of decisions every day. And these decisions are based on varying levels of knowledge, and on varying estimates of the immediacy of the issue. In the back of everyone's mind, there is a real concern that you will pass some threshold, in a biological system, for example, which you will find irreversible. I don't think that any of us would doubt this for a minute.

I think the question is, given today's resources of energy, manpower and interest, how are you going to allocate these resources, resources which are always scarce? Given choices, it does not do, I think, to say that we will do everything; we may, but we will do so over some span of time.

My concern is that we recognize that we have various levels of understanding. We know more about how to treat water to drink it than we do, in my mind, about precisely what the ecological effects of various decisions may be. The question then becomes one of how much weight shall we give to the drift or sequential set of changes we make.

And I find that very hard to evaluate. The concern is certainly there, as Ruth has said.

(*Commissioner Baxter*) My first one is going directly back to the question, which, if I remember right, said, "Why do we give such low priority to water pollution abatement?"

For those of us who operate water pollution plants, either for a municipality or an industrial plant, none of us would agree that the regulatory agencies have given a low priority to the problem. The demands that have been made on us really place water pollution control work at a very high priority. So we are not giving it a low priority. That will be my first point.

My next point I approach with a lot of hesitancy because Ruth Patrick and I have worked together in many, many things, and I hesitate to go into her field. But I would suggest this to all of you: that we live now in a country where things are far better than they ever were before anywhere on this earth and at any time on this earth. I agree cer-

tainly and completely that we have to look after the changes in our environment. But if we are saying that today we are worse off than we were 40 or 50 years ago or worse off than we were a hundred years ago, I don't agree with that at all. We are better off today because we are able to handle these problems. It makes an awful lot of difference whether we have a couple of million Indians in the United States or whether we have two hundred million people. If we are going to have two hundred million people and want to live all together on paved streets, without digging wells for our own water supply, we can't go out as our forefathers did here and grow our vegetables in our backyard gardens. (Some of us try it, but we don't get very far.) So we have to balance those things with what is considered as modern living in a nation with two hundred million people and with so many of us jammed up in cities. But we are better off than we were.

And this doesn't mean that there should be complacency. It does mean that we have to keep working on this problem. Don't let us think that we've sold ourselves down the river. I don't agree with that.

(*Mr. Murphy*) The Commissioner, of course, has raised one of the hard problems, which is the question of making comparisons in historic time. This is one on which there is tremendous dispute, largely because of, as Dr. Wolman pointed out, the difficulty of getting statistics for times past. We know roughly where we are today. We don't know too well what our grandfathers had to cope with.

Of course again, we come back to the question of values. I may be misquoting Jane Jacobs, but I think I recall her saying that a city park is where you go to get mugged. Now, therefore, she seems to be against city parks. I, myself, have always appreciated Fairmount Park in Philadelphia. Of course, we have to agree that there are parts where you wouldn't walk alone at certain times of the night. And yet we all feel, or at least I feel, that it is a pair of lungs for the city.

Will you please explain the problem of the salt line in the Delaware River which was a matter of some considerable public concern, leading to actions by the Delaware Valley Basin Commission in July, 1965? Does the silt level in the Delaware River have any effect on salt water encroachment, either to encourage it or abate it? Will the possibility of desalinating ocean water have any effect on Philadelphia's municipal water source in the near future?

(*Commissioner Baxter*) First of all, you remember that Dr. Wolman said that the average chloride content in rivers around the country was about 20 parts per million. That is generally correct. At our Torresdale intake on the Delaware, when conditions are normal, it's about 15 parts.

(One of the interesting things about it, by the way, is that, while we can't do much about it because of variations of the tide, water with perhaps 80 or 90 or 100 parts of chloride makes better coffee than water with 15 parts in it. And if you don't believe that, some day put a pinch of salt in your coffee. People come to this town from parts of the country where the water has about 100 parts of chloride in it and complain about the water, because it makes the coffee taste poorer than it does in their own areas.)

In terms of the New York situation when we had publicity about the salt lines some years ago, there are some general points which can be made. First of all, the salt line is not, as I think most of the people here who have any scientific background know, at any specific place. Ocean water, if I remember right, has 33,000 parts of chloride. The fresh water coming down the Delaware has only 15 parts, so somewhere along the river we determine an arbitrary salt line. People have used 250 parts because that happens to be the sug-

gested limit in the U. S. Public Health drinking standards.

When New York, a few years ago, decided unilaterally that it would not live up to the Supreme Court decision which required it to release water downstream while it also diverted water out of the basin to New York City, Philadelphia and others in the Delaware basin faced a real problem, and we had to highlight the issue.

Now, one of the issues was the fact that, as fresh water was kept out of the basin by diversion, the salt line moved up the river: we had to fight this particular thing in the Delaware River Basin Commission, in the public press and in a number of other places.

Now, try to explain to the public the fact that we wanted to maintain a flow of 1,700 or 1,500 cubic feet per second on a gauge at Montague. Such a thing as that is impossible to explain to the public. But a salt line creeping up to the Torresdale plant was something that was easily understood by laymen. I chose, and I was probably the one to start it, to put the emphasis on the salt line's coming up the river, rather than the amount of fresh water maintained on the gauge upstream. This got everybody excited, and each day the newspapers would call and ask, "Where is the chloride line? Where is the salt line?" (Believe me, ladies and gentlemen, it wanders all over the river, but for the public press I had to say that it was at an exact point at a particular time. It varies with the tide, as you can imagine, and it varies with a little bit of rainfall.) It never seriously affected Torresdale although, by the time the whole issue became a public matter, the President of the United States intervened and sent top cabinet people here. Something had to be done even politically, so there were all sorts of suggestions. One, and a very good one, was that, if by any chance excessive chlorides did get to Torresdale, the Army would put pipe lines upstream from Torresdale and bring water to the plant from upstream. This was a very good point. It so happened that three or four years ahead of that we had started to build a new intake at Torresdale which had the effect, because of the way that we were taking water at high and low tide, of moving the intake upstream about 15 miles. This was another safeguard if the situation did reach an extreme condition.

Now, the second question had to do with silt and its effect. Honestly, I don't know the answer to that. I completely pass that one.

The third question concerned desalination plants on the Delaware. Studies are being made all over the country. My own opinion is that, particularly in the humid part of the east, we have a long long way to go before we will be using desalination plants.

At the first plants, the cost was about one dollar a thousand gallons to change sea water into fresh water. There were claims that a new plant, a large one in the San Diego area, would get that price down to 22 cents, but the whole thing has been practically abandoned because the total cost originally set for some 400 million dollars is now above 700 million dollars.

Although the price to treat water in desalination plants now in use is still about one dollar per thousand gallons, we still treat water at Torresdale at eight cents a thousand gallons. Until people want to use desalinated water and are willing to pay three, four, five or six times for it, I don't think that we're going to see it here.

Let me say one final thing about the plant on the west coast that was going to be used. This going to provide almost distilled water. Believe me, no matter what you think of Philadelphia water or even that from Dr. Murphy's home town, you don't want to drink desalinated water just as it is produced. In fact, one of the things

that they were going to do out there in Los Angeles was to mix this desalinated water with the water coming down from the Colorado which has a very, very high content of solids in it so as to make one better and one worse depending upon which way you want to look at it.

(*Dr. Sturgis*) I want to ask Dr. Wolman a question. I've been waiting for him, as a geologist, to come forth with some very profound statement like that of Claire Patterson, the geochemist from Cal Tech, who is deeply concerned with increasing lead levels in the oceans of the world.

I'd like to ask Dr. Wolman if there are any increases in various minerals and trace elements in the water that are of geologic significance that we ought to be thinking of in longer terms than a few years?

(*Dr. Wolman*) I think the answer is that in some instances, particularly with lead, there is some evidence of such increases. To my knowledge, the question of whether or not they are of long-range either geologic or human significance is exceedingly difficult to tell. At least, I do not know.

On a similar scale, but in regard to the atmosphere rather than to the oceans, concern has been expressed about the increase in carbon dioxide. The increase in carbon dioxide as a result of the burning of fossil fuels, as many of you I'm sure have heard, is presumed to be, or has been perhaps responsible for increases in temperature on the order of three to five degrees on the east coast in the last fifty or sixty years.

However, the carbon dioxide cycle is complex, including not only plants and the atmosphere but the oceans as well. Thus, it is not clear whether one can simply project an increase in CO_2 in the atmosphere or whether changes will take place in the CO_2 content of the oceans and in rates of carbonate sedimentation. In addition, some recent observations indicate a recent temperature decline, a fact not consistent with the continued combustion of fossil fuels.

So my answer is, yes, there is some evidence of change and of increases in certain compounds or elements going to the sea and to the atmosphere. I would hesitate to evaluate the significance of these observations in the context of today's topic.

I'm sorry to disappoint Dr. Sturgis and others who might have hoped I would have taken a geological view since that is my background. Staying on the ground, I should say that our historic and geologic view is unfortunately rather limited. For example, when Hoover Dam was constructed on the Colorado River in the 1930's, it was estimated by some that the reservoirs might fill with sediment in fifty years. A detailed study carried out over a period of one-fifth of that time, ten years later, indicated that the lifetime of the reservoir would be on the order of at least 400 years. Not all of course, would last that long. Here one might take a long view. Reservoir sites are scarce, and there is indeed a real question, given a geological perspective as to whether to use these sites now or to hold the option open inasmuch as the geologic rate of erosion is significant in this time span.

Such a time perspective is important, but it may be worth noting that such a perspective does not always lead to preservation. In some cases a "geologic" view demonstrates both the variability of the natural environment and the fact that such variability may encompass the full range of what we erroneously assume to be the consequences of the activities of man. This is not a defense of indiscriminate change by man. Rather, it is simply an indication that we know relatively little in some of these areas.

(*Mr. Murphy*) Of course, that opened up another box. But to go back to the ocean problem, about which I think Dr. Patrick wanted to speak.

(*Dr. Patrick*) The comment that I wanted to make probably doesn't relate to the long-term change of chemicals or the

geochemical cycle but rather to chemical changes involving less time that may be important. These relate to both inorganic and organic chemicals.

The building of dams in many of our rivers is changing the quality of water, because water in many cases is withdrawn from a very low level which contains relatively unoxygenated water. Any student of limnology knows that unoxidized water such as that near the bottom of a lake or reservoir has in it many micro-chemicals in concentrations that are typically not found in water that is oxidized. The result is that, when releases are made from lower levels in a reservoir, higher concentrations of manganese, iron, cobalt, etc. may occur than is in the upstream free-flowing water. In this way, the dam operation may bring about deterioration in water quality. In this way, the very management of rivers which we are instituting throughout this country is changing the quality of water as to micro-elements.

Another point that I want to emphasize is that we are manufacturing many exotic organic chemicals, and some of these are finding their ways to our surface waters. What the effects of these exotic chemicals which pass through our ordinary sewage treatment and our ordinary water treatment plants are going to have on human beings over a long period of time we just don't know at the present time. It is one of those research areas that certainly should be investigated.

Can water drawn from so-called artesian or high capacity wells be used to supply municipalities? Quantitatively, is this a greater or lesser potential supply? What is the quality of water taken from these below ground levels?

(*Dr. Wolman*) In the interest of time, I shall answer only in part. There is, of course, considerable potential for ground water development in the United States as a whole. The volume of storage is very large.

I think, however, that there is some misunderstanding as to the "separateness" of this potential reservoir from the rest of the system. Ground water is water in storage in a part of the hydrologic cycle. It is replenished by precipitation and, in turn, contributes runoff to streams. Thus, while some suggest that ground water provides a separate "source" of water over a long term (and I'm happy now to be able to agree with Dr. Patrick), the only way that you can get more out of the ground is by "mining" the ground water, which results in lowering of the water table.

In an area such as the coastal plain of New Jersey where rainfall and infiltration are both large, water is readily recharged to the ground. The source is a good one as well, because pumping from the permeable strata is also easy. In addition, the sandy strata provide a natural filter.

On the average, the dissolved mineral content of ground water in the United States is higher than that of many of the surface waters. There are areas of particularly hard water in parts of the west and plains states. On the coastal plain, water quality is high, and I suspect will be a source of supply for a considerable period. Its management in terms of depletion and rate of use is a separate problem.

The second question relates to problems involving costs of pumping, distribution, etc. These costs will vary from place to place. But here I turn to Commissioner Baxter.

(*Commissioner Baxter*) I don't pretend any competency in knowing what goes on in the whole underground cycle. I know a little something, and I think, as Dr. Wolman said, that where underground sources are used, particularly where they are used for large supplies, problems are raised.

Dayton, Ohio, is an example. Dayton uses an underground water system, but the water is so hard that they have to operate a very expensive softening plant in order to make it usable. Memphis, Tennessee,

also uses an underground source, even though Memphis is on the Mississippi.

One of the largest underground sources of water is only 30 or 40 miles from where we are sitting, the big Wharton tract in southern New Jersey between here and the coast. I've seen various estimates as to how much the safe yield is from that source, six or seven million gallons a day, I understand.

One of my predecessors in 1885 tried to get it as a source for Philadelphia water. New Jersey refused, and, therefore, we are using the Delaware and Schuylkill Rivers and not the nice clean water of the Wharton tract, which is now state property in New Jersey.

(*Mr. Murphy*) The Wharton tract, of course, involves the problem that Dr. Wolman raised, namely, the recharge mechanism of these aquifers. Because of the water policy of New York City of forming its reservoirs in the head waters of the Delaware, chances are that a great deal of water that would normally enter the Wharton tract is now cut off and would not replenish the tract if we started pumping water from it. We would definitely be mining the Wharton tract down to a certain level. I think this is the general consensus because of the current problem of getting water to run off the Kittatinny Mountains below the Catskills down through Jersey. Jersey is a sort of enormous peninsula, actually. And, of course, if we mined beyond a certain point, we would run the risk of a collapse of the aquifers from salt water encroachment.

In fact, I think that during the salt water invasion, the city that was most endangered was Camden, whose wells, because of D'Arcy's law, were being invaded by salt. Camden's wells directly recharge from the Delaware, rather than from the Wharton tract. And they were drawing sodium chloride into their system to the point where Campbell Soup stopped using them as their water supply and went to another source because it was not possible to use those wells in their processing.

By concentrating upon special areas in the field of water pollution, do we tend to avoid the total problem? For example, by concentrating on the ecologic problems of micro-organisms or by concentrating on the potability of water, do we avoid the total problem of water pollution? Is this analogous to the policy of medicine in the past half century, which has concentrated on specialty areas rather than on the general health of the entire organism?

(*Dr. Patrick*) It seems to me that when there are just a few people, relatively speaking, the impact of what people do is not very great.

For instance, when there were just a few people, they could put raw sewage into water without causing diseases such as typhoid fever. But now as more and more people live close together, the problems of bacterial contamination and disease arise. I think that lack of diversity, not only in regard to water pollution, but also in regard to sociological problems of all sorts, including disease, become more severe as more people interact. I think that it is only within the last thirty years that these problems have really become acute. Lack of diversity of people in our cities, that is, too many people doing the same kind of thing, the same income group living in the same place, is leading to many of our sociological problems, we are told by sociologists.

Likewise, too many people manufacturing the same things and producing the same kind of pollutants, whether they be farmers upstream with five hundred head of cattle to an acre and all the insecticides and weedicides they use on farms, or whether they be industries concentrated in the city, they are bringing into being or intensifying problems of water pollution that previously we didn't have.

I think that with the aid of computers,

with our better approach towards systems analysis that Dr. Wolman spoke about earlier this morning, we have considerable techniques and hardware, shall we say, to tackle these problems. I think that we would be very remiss today if we did not look at the whole problem of medicine and of the environment.

(*Commissioner Baxter*) I want to say that this problem is not being avoided by anybody.

The city of Philadelphia has recently signed a contract with the Reading Railroad to haul refuse from Philadelphia to certain abandoned mines in northeastern Pennsylvania. Will this refuse have a harmful effect upon aquifers in that area and by way of the aquifers upon the surface waters there?

(*Dr. Wolman*) I doubt that there is yet really detailed information available with which to say precisely what the effects will be. Some experience elsewhere with sanitary landfills may be pertinent, but I don't know what is going to be hauled to the mines. Mr. Baxter, I suspect, does. While some landfills have posed water contamination problems, carefully selected locations and well operated installations have controlled such problems. I believe both laboratory and field studies are being made on such installations.

Experiments are being run in Pennsylvania, and I think similar studies are being made in the Chicago area. Going way out on a limb, I believe the approach is to study the feasibility of large-scale operations and to monitor the effects, if any.

(*Commissioner Baxter*) Actually, at the present time, a reaseach foundation, of which I happen to be board chairman, is spending about a third of a million dollars in the Chicago area on a project which has the title, "Rail Haul Disposal of Refuse." This refuse, incidentally, is garbage and all other material put together.

Primarily we started out to see what can be done by using rail cars to haul refuse away from big cities where there are no land disposal areas at close hand. The project is looking into every last phase of it, including the kind of railroad cars that should be built to carry this material and methods of compacting the refuse so that the cost of hauling it will be as low as possible. There is a place in Japan that is doing it on a large scale. We have sent some of the people on our project over there.

Part of the research that we're doing on this is to see what can happen to refuse in landfills. We have biophysicists who are taking a look at compacted refuse, including the organic garbage that is in it, to see what will happen when it is placed in a landfill or an abandoned quarry or mine. How long will the organic matter stay? What kind of breaking up will happen? The report on this research is due in about another year and a half. In fact, I'll be in Chicago in ten days to hear an interim report.

(*Mr. Murphy*) As to what can be done about it, of course there are any number of devices that could delay or test the program but the success of these would depend upon the kind of evidentiary material which could be brought out by experts in the field.

Have the runoff and land erosion potential been used as a basis for new land use control in urban areas?

(*Dr. Wolman*) Sediment control programs are in use in Montgomery and Baltimore Counties in Maryland and in Fairfax County, Virginia. There may be others as well. Most efforts appear to be directed toward requiring developers to provide a plan for the control of runoff and sediment during construction, the plan to be approved along with plans for grading of roads, for installation of sewers and water supply. I believe that an evaluation in Montgomery County after a year of opera-

tion indicated that programs were effectively controlling the sediment at roughly 50% of the sites. The degree of effectiveness varied in the others and some were uncontrolled.

(*Mr. Murphy*) I might also point out that the Southeastern Wisconsin Regional Planning Commission has considered some of these problems along with the problem of soil structure and the use of geologic surveys on soil structure to assist in planning new towns and suburbs in that area, so that certain so-called moist lands would be completely avoided for settlement and continue to serve as recharge mechanisms for smaller lakes.

(*Dr. Wolman*) One point might be added here related to the use of known technology in reducing some water problems. Much of the technology developed in agricultural conservation is applicable to silt control in urban areas. While specific sites may pose some difficulties, the reluctance to use the techniques has little or nothing to do with the level of scientific information. There is an added cost, to be sure, and the cure is not perfect, but progress in adoption of programs appears to be unreasonably slow. Some are perhaps justifiably angry at this pace, inasmuch as the approach does not involve multi-million dollar expenditures in areas of great uncertainty.

(*Mr. Murphy*) I might add, too, that a great deal of the problem in sedimentation of streams in developing areas is the result of road builders. Some of the worst offenders have been our highway and federal road programs. In the midwest, where a number of new highways have been put through and where streams have a high sediment level to begin with, and which are, for the most part, rather small streams, what has been done to some of these streams through road building programs is simply shocking. To think that this has been done by government, which is the agency that ought to be concerned with stream management and regulation, is particularly disgusting, especially when it could be controlled with a somewhat small additional expenditure, if any.

This is, I think, one of the things that is most annoying: that something could be done of tremendous consequence that wouldn't cost much more money to avoid and, instead of its being done, a problem is created which only a tremendous expenditure can solve.

Are controls on silt runoff voluntary? Is there any legislation concerning the control of silt runoff? Is it local in nature? Does the state of Maryland have such legislation presently on the books, and is any such proposal being considered here in Pennsylvania?

(*Dr. Wolman*) Most programs are voluntary, I believe, in execution, although submission of plans is mandatory. A good deal will probably depend upon interest in enforcement. In Maryland, the Department of Water Resources is concerned with water pollution and as sediment has been defined as a pollutant, violaters can be brought to court. The procedure is cumbersome for this ubiquitous activity and hence the permit approach is being promoted. There is no other state legislation.

Is there some regulation that requires chemical companies, as they change the character of their effluence, to acquire new permission from the regulatory authorities as to the nature of the treatment required?

(*Dr. Patrick*) Whenever a company is changing the kind or amount of effluent, the industry must tell both the state and the interstate groups about such changes and obtain permission to discharge any wastes into the receiving body of water. They have to provide certain information about the waste, as to its biochemical oxygen demand, its toxicity and so forth before they are allowed to discharge it. The state also from time to time monitors the

effluent of all industries in the state to see what they are discharging, that is, they go in from time to time and take samples to see what the quality of the waste is. In the case of the Delaware Basin, this task is assumed by the Delaware Basin Commission to a large extent, though the states also function in this manner.

(*Mr. Murphy*) As a matter of fact, many states have had for some time these chemical monitoring programs. Indiana has had such a program since 1957. And, as Dr. Patrick points out, the big problem is the thoroughness of these monitoring programs. In most states they are still pretty selective and one of the problems is to make them more widespread.

(*Mr. Murphy*) Dr. Pfeiffer (in the audience) has stated that last year the Commonwealth of Pennsylvania passed a statute requiring sewage planning by municipalities, so that the problem of the disposal of both sewage and runoff water in municipalities, particularly suburban developments, would be covered by legislation and would require a system of regulation and controls.

She has pointed out, in addition, that this year the state passed a solid waste act, which is to become completely effective next year, that will regulate the disposal of solid wastes in strip mines and other underground areas that are designed to be filled up, and that this system of regulating compacted waste is now on the statute books in Pennsylvania.

It would appear from this statement that Pennsylvania has a somewhat more extensive legislative enactment than has been proposed in Maryland.

Given the condition of increasing eutrophication in lakes particularly, might it be possible to take advantage of this eutrophication by harvesting algae for some commercial purpose, so that, instead of reversing the eutrophic process, we would take commercial advantage of it?

(*Dr. Patrick*) Lots of things have been suggested. Let me address myself to the problem in lakes. In lakes, unlike rivers, nutrients are continually re-cycled. Most of the algae blooms in lakes are microscopic algae, particularly the blue-green algae. *Anacystis cyanae* is one of the common ones. *Anabena* is another one. Now these algae are very very difficult to harvest because of the fact that they are so small. It is possible to harvest them by filtering water through sand beds or by coagulation, but harvesting is rather difficult with present methods.

Another attack on this problem is to try to find an organism that will eat these algae and to introduce these organisms into the lake. This would be a biological control.

Another thing that has been suggested is to dredge out or remove some of the sludge deposits that are rich in nutrients in Lake Erie. This would help the situation.

You have to handle each problem acaccording to the problem involved. Now, one of the ways of tackling this problem in our streams is to build small ponds in the flood plains. Such small ponds that are relatively shallow we have found by rough experimentation to be very effective. In nine hours they will reduce the nitrates and phosphates fifty percent. The algae are probably largely responsible for these reductions. These ponds could easily be constructed. They would be excellent and safe places for children to ice skate, to sail toy boats and to fish.

Instead of constructing buildings on the flood plains, we should use them for recreational areas and divert part of the flow of streams through ponds. I think by this means we could do a great deal towards reducing the problem of eutrophication in many of our streams.

What is the possible effect on the quality of water in Lake Erie from a present pro-

gram of injecting acid waste into land areas adjacent to the lake?

(*Dr. Patrick*) I don't know about that program.

(*Dr. Wolman*) Neither do I.

(*Mr. Murphy*) Commissioner Baxter, have you any information on that question from any of the groups in which you participate?

(*Commissioner Baxter*) I know that there is a great deal of experimental work, both laboratory type and pilot plant work, along Lake Erie.

There was a considerable noise last summer when some agency up in that area near Buffalo or near Erie, Pennsylvania, wanted to discharge material out in the lake and it was prevented from doing so even though on the Canadian side this had been going on for quite some time.

That's the only answer I can give to the question.

(*Mr. Murphy*) Of course, as far as Lake Erie is concerned, one of the problems is that it is an international water body. The Ontario Water Board is not subject to any control from this side, and there is a certain tendency to pass blame back and forth across the frontier.

(*Commissioner Baxter*) One other comment may put some of this into the framework of cost. The state of Pennsylvania, of course, has issued many stringent orders on people, but up there it turned out that after orders had been issued a lot of recreational use in the vicinity was affected by the orders. The state itself said that it was costing the people of Pennsylvania thirteen million dollars in the recreational industry and the state better stop issuing such statements about the condition of Lake Erie. This again shows that whose ox is gored is very important.

(*Mr. Murphy*) Well, of course, if you have attended any of the meetings of the various states, you very quickly learn that Ohio has a tendency to treat Pennsylvania as an interloper. Their attitude is that Pennsylvania has such a trifling part of the lake shore compared to what Ohio has that it is easy for Pennsylvania to meet its obligations and very hard for Ohio. The trouble is that Michigan has an expanse not much greater than Pennsylvania's, but in that expanse comes the River Rouge and the Detroit River. So it isn't so much the portion of the shore as the size of the water system draining through that rather small part of the littoral. Indiana, which doesn't have any lake shore, has to make a material contribution because of the Maumee River.

I feel that today's panel has successfully fielded the questions put to them with the exception of the injection of acid wastes into areas adjacent to Lake Erie. We simply did not know about that practice.

I want to thank each one of you for being here. I want to thank each one of you who is here in a representative capacity and to thank the organization which has sent you. I want to thank the Philadelphia County Medical Society and The College of Physicians, the foundation which has underwritten the cost of this program, and the various groups which have co-operated in the organization of this program for their interest, help and cooperation. I trust we can count on your future concern and work in this very, very vital area.

Cooperating Groups

Academy of Natural Sciences of Philadelphia
Brandywine Valley Association, Inc.
Bureau of Muncipal Research
Catholic Social Services
Chester County Health Department
Delaware County Tuberculosis and Health Association
Delaware River Basin Commission
Delaware River Watersheds Association
Delaware Valley Hospital Council
Delaware Valley Jaycee Regional Development Council
Division of Sanitary Engineering, Pennsylvania Department of Health
Dravo Corporation

Drexel Institute of Technology
Fels Institute of Local and State Government, University of Pennsylvania
Franklin Institute
Friends of Tinicum Marsh
Free Library of Philadelphia
Greater Philadelphia Chamber of Commerce
Green Valleys Association
Hahnemann Medical College and Hospital of Philadelphia
Heart Association of Southeastern Pennsylvania
Institute for Cancer Research
Izaak Walton League of America, Inc.
Jefferson Medical College and Medical Center
La Salle College
League of Women Voters of Pennsylvania
League of Women Voters of Philadelphia
Neshaminy Valley Watershed Association
New Jersey Department of Agriculture, Division of Rural Resources
New Jersey State Department of Conservation and Economic Development
New Jersey State Department of Health
New Jersey State Federation of Sportsmen's Clubs
Pennsylvania Game Commission
Pennsylvania Geological Survey, Pennsylvania Department of Internal Affairs
Pennsylvania Health Council, Inc.
Pennsylvania Medical Society
Pennsylvania State Department of Health
Pennsylvania State Soil and Water Conservation Commission
Pennsylvania Tuberculosis and Health Society
Philadelphia Chapter, American Institute of Architects
Philadelphia City Planning Commission
Philadelphia College of Osteopathic Medicine
Philadelphia College of Pharmacy and Science
Philadelphia County Dental Society
Philadelphia Division of the American Cancer Society
Philadelphia-Montgomery Tuberculosis and Health Association
Philadelphia Section of The Pennsylvania Chapter, American Society of Landscape Architects
Pompeston Creek Watershed Association, Inc.
Red Clay Valley Association, Inc.
Roy F. Weston, Inc.
School District of Philadelphia
Scott Paper Company
Southeastern Chapter of Trout Unlimited, Inc.
Southeastern Pennsylvania Chapter, American Red Cross
Stony Brook-Millstone Watersheds Association
Swarthmore College
Temple University
Tocks Island Regional Advisory Council
United Cerebral Palsy Association of Philadelphia and Vicinity
University of Pennsylvania
Upper Raritan Watershed Association
Water Resources Association of the Delaware River Basin
Wissahickon Valley Watershed Association, Inc.
Woman's Medical College of Pennsylvania
Zoological Society of Philadelphia

Malnutrition in the Rich and the Poor[1]

By JEAN MAYER, PH.D., D.Sc., A.M.(Hon.)[2]

ALL of us, at one time or another, have had lovers' quarrels with our country. These are necessary if we are to progress. There are moments in history when such quarrels tend to be somewhat overwhelming. After watching Mr. Daley and his shock troops and the whole Democratic convention in Chicago, or after listening to Mr. Agnew or Mr. Wallace, it is easy to despair of the state of the country. The intellectual and moral resources of the United States are so great, however, that, however bleak the present, we know that somehow the country will survive and will at some time shine again as the last best hope of mankind.

As a nutritionist, I have to go through a similar process of reassurance as I look at the context in which my science is applied in my country at present. There is, of course, no "national" science. As medical scientists, we are alumni of Cos, of Athens, of Alexandria, of Gundishapur, of Salerno, of Montpellier as much as we are alumni of our own medical or graduate schools. The development of every modern science, nutrition in particular, has been international: Lavoisier, Magendie, Liebig, Rubner, Voit, Hopkins, Mellanby and countless other non-Americans have been responsible for the development of our knowledge of nutrition. John Boyd-Orr, André Mayer and Wallace Aykroyd have been key figures in the application of this knowledge to the betterment of mankind. And yet in many ways, if any science has been an American science, nutrition has been an American science since Atwater. Atwater came back from Europe in 1892 resolved to analyze all important American foods, to learn how many calories and how much protein Americans consumed daily, to determine the availability of aliments through digestion and absorption, and, on the basis of data thus obtained and of studies of the economics of food purchasing, he hoped to develop the ideal diet for the least cost.

From then on, an ever growing number of scientists—Graham Lusk, Osborn and Mendel, McCollum, Goldberger, Elvehjem and your own Paul Gyorgy are the names which jump to mind as the pre-eminent examples—have labored to develop our knowledge to the point that there are probably more persons who call themselves nutritionists in the United States than in the rest of the world. Our academic structure, with our great land grant universities and their colleges of agriculture and their colleges of home economics, the unparalleled development of our agricultural extension services, and the wealth and vigor of our food industries have contributed to the popularization of nutritional advances among our people. The attention paid to nutrition since the end of World War II in the pathogenesis of degenerative diseases has been sparked by the work done by Ancel Keys at Minnesota and by work done in other American universities (would it be immodest to cite my own university as an example?).

Neither has our country been a laggard in the extension of our knowledge and in the spending of our riches to benefit the world at large. It was President Roosevelt who proclaimed that "Freedom from Want" was one of the allied war aims. The

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Food and Agriculture Organization was born in the United States at the Hot Springs, Virginia, Conference in 1943. UNRRA and UNICEF were similarly concerned here. And the story of our donating gigantic amounts of food to needy countries, first to Europe at the end of World War II, then to Asia, Africa and Latin America, is one of the most glorious pages in the history of mankind.

It is all the more disheartening to contemplate the situation today. Our nutrition programs everywhere are miserable. Look at our programs abroad. Technical assistance to underdeveloped countries has been cut to a niggardly, almost non-existent level. Our government has made as feeble an effort as it was possible to do about Biafra, the site of the worst famine in modern times, while still appearing to be concerned. And in Vietnam, we are constantly enlarging a crop destruction program which has yet to prove of any military value whatsoever, but which is contributing massively to malnutrition and to the refugee problem. Even well-intentioned programs, such as our Food for Peace program, have been mostly self-defeating as far as assistance to underfed countries is concerned: it was designed in part to create markets for our agricultural surpluses; it has succeeded in this regard by prolonging the dependence of recipients on our agriculture; it has failed to help them to develop theirs.

Nutritional programs within the United States have been equally disastrous. Our National School Lunch and Milk Distribution schemes have been used by the Department of Agriculture to use up agricultural surpluses rather than to correct deficiencies and educate our young in sound nutrition habits. The Food Stamp and commodity distribution programs have been perverted to use up surpluses. The Secretary of Agriculture has not exerted the necessary efforts to extend these programs to more than a fraction of those who need them. And poorly designed, poorly executed U.S. Department of Agriculture surveys have added to the confusion by drawing attention away from really ill-fed groups (unemployed agricultural workers in the South, migrant workers, certain Indian and Eskimo groups, and many denizens of large cities) and widespread deficiencies (iron, fluorine) to "focus" on enormous groups who do not (and do not need to) consume quite as much calcium or vitamin C as the recommended dietary allowances (which include large safety factors so as to cover the needs not of the average, but of practically every person) suggest. We still are doing little to popularize birth control measures and make the means available to all. We have done almost nothing to make it possible for as many adult males as possible to exercise (even though we shall see that this may be the most urgently needed measure). Nor has our government laid the necessary ground-work to decrease the amount of saturated fat and increase the amount of polyunsaturated fats consumed by our hypercholesterolemic population. In short, while our knowledge is great and increasing, our failure to put it into action at the service of our people and of mankind in general is almost total. Let us look at what should be done and why it should be done.

The Poor

Many of the poor underfed countries are in the tropics and too often their state of nutrition is described as "tropical malnutrition." This is a misnomer. We all too often forget that even many of the "tropical" infectious diseases are not tropical but are the results of poor sanitation and social disorganization. Yellow fever epidemics took place in the United States until the end of the nineteenth century. The last yellow fever epidemic in New York took place in 1870. Cholera epidemics followed the arrival of the Irish immigrants in the 1850's with the last epidemic to be seen in New

York City taking place in 1866. Malaria was a danger in New England until this century. Diseases like poliomyelitis, the bubonic plague, typhus, etc. are "tropical" because they have been eliminated from industrialized countries. Just as generally speaking there are very few really "tropical" infectious diseases (most of them are diseases of poverty, ignorance and social disorganization), there are no "tropical" nutritional diseases. All of the syndromes of malnutrition seen in the tropics have been seen (or are still seen) in temperate climates if the people were (or are) sufficiently poor and ignorant. These tropical nutritional diseases are essentially diseases characteristic of a certain stage of civilization.

While the opinion is frequently expressed that tropical climates, whether dry (arid zones) or humid (e.g., tropical forest climates), cause unusual changes in nutritional requirements, there is, except in the matter of calories and water, little evidence to support this view. The widely prevalent malnutrition there is largely an expression of insufficient supplies of protective foods, selectivity of diet determined by the cultural and religious backgrounds of the people, and the direct and indirect effects of infection. Many people in tropical climates are unable to obtain the basic foods essential for a good diet. The problems are fundamentally agricultural and economic rather than climatic. Other groups, because of religious beliefs or social practices, avoid available animal protein. Still others pefer polished to unpolished rice. Parasitic or other gastro-intestinal infections may interfere with the absorption of specific food factors or utilize those available for their own economy at the expense of the host. Systemic infections, by their effect on the metabolism of the tissues of the host, may increase significantly the daily requirements for particular nutrients. Thus, the essential problem will vary from region to region, depending upon the practices of man and only secondarily upon the effects of climate.

Energy requirement is decreased in the tropics, since the higher environmental temperatures diminish the need for heat production. The relative importance of temperature has, however, often been overemphasized. On the basis of controlled observations and national averages of calorie intake in various climates, the Second Calorie Requirement Committee of the United Nations Food and Agriculture Organization estimated that there is a 3% decrease in caloric requirements for every 10° C. of mean annual external temperature above the reference temperature of 10° C. Available evidence also indicates that high environmental temperatures do not introduce important changes in protein requirements. Low fat consumption in many tropical areas is apparently caused by essentially local conditions. While it has been asserted that requirements for thiamine and ascorbic acid are increased by heat, the evidence in support of this is unconvincing. Similarly, claims that tropical climates per se predispose people to rickets are obscured by lack of control of other factors, such as the availability of calcium and phosphorus. The vast preponderance of evidence indicates that vitamin requirements of healthy persons are essentially the same in both temperate and tropical climates.

No striking deviation from temperate zone requirements, except for water, is thus characteristic of tropical conditions. The tropical climate itself may play a secondary role in the evolution of certain nutritional diseases, in that climatic factors, such as wind, exposure to sun and extreme heat, may influence nutritional dermatoses. The effect of sunlight on skin appearance in pellagra is well known. Local climatic conditions may contribute to the differences in skin abnormalities associated with kwashiorkor in various

regions of the world. But the essential significance of tropical nutritional diseases lies in fields other than human physiology. An obvious and well known factor is the prevalence of parasitic and infectious diseases. These will often contribute to decreased intestinal absorption sometimes to increased requirements, and usually to some degree of anorexia. Another and more important factor is the agricultural, economic and social status of many tropical populations. Many such peoples subsist on a diet based exclusively on one principal starchy staple food, such as rice, millet or corn. The classic deficiency diseases characteristic of such diets could perhaps best be termed "diseases of society" rather than "tropical diseases," despite their geographic localization.

Pathologic conditions associated with malnutrition and found in the tropics may be classed in four categories:

1. Syndromes which are essentially of dietary origin, even though they may be complicated by parasitic and infectious conditions, for example, beriberi, pellagra and kwashiorkor.
2. Conditions which are probably of nutritional origin, such as tropical ulcer, sprue, pernicious anemia and certain urolithiases.
3. Conditions of unknown etiology in which nutritional factors appear to be important, such as primary carcinoma of the liver and certain pancreatic fibroses.
4. Diseases the primary causes of which are non-nutritional, but in which nutritional factors affect directly the response to the pathogenic agent or which contribute indirectly to the development of complicating malnutrition. As an example of this fourth class, the frequently fulminating character of tuberculosis in tropical Africa is probably due to the weakening of the host by years of mediocre or inadequate nutrition.

What about the future of nutrition in poor countries? I have developed elsewhere (1) the concept that while the rate of the population increase in the world is frightening, to equate, as has been done by too many, the problem of overpopulation with one of food supply is to perpetuate a dangerous error. For, while there is every reason to believe that the nutritional situation is going to be worse in many continents, it may eventually be solved altogether when food is produced by non-agricultural methods. This would not "solve" the population problem; it would in many ways make it worse. But first let us examine the food and population situation as of now.

World War II was not a Malthusian check: in spite of the horrendous numbers of soldiers and civilians killed, in spite of the massive genocides perpetrated by the Nazis, food production was decreased much more than population. By 1945, intakes per capita were 16 per cent lower than the 1934–8 average. The creation of the Food and Agriculture Organization, a specialized United Nations Agency which, during its first years, was endowed with particularly articulate spokesmen, dramatized the world-wide concern over the food situation. The difficulties inherent in getting agriculture going while industry and means of communication were not yet rebuilt led to a generalized feeling of pessimism: cereals, oils, meat, dairy herds were in succession the object of much attention, the conclusion being in each case that pre-war levels of production and consumption were not going to be reached for years. The chaotic state of international trade accentuated shortages, which UNRRA and various emergency agreements attempted to cope with on an ad hoc basis. And yet very quickly, the situation improved; the oil shortage vanished first; while the gigantic ground nut scheme of the British government which was supposed to mitigate it was taking off for a

very slow start, the reappearance into the channels of trade of adequate amounts of fats and oils eliminated the motivation for the scheme itself. United States production of cereals and animals products, and that of overseas dominions, which had grown during the war in spite of lack of abundant manpower and the diversion of chemical industry to military purposes had to be slowed down as surpluses started accumulating and, with their appearance, the threat of a collapse of agricultural prices loomed. By 1952–3, the world-wide rate of per capita production of food had overtaken pre-war rates. Since then, the age rate of increase in the production of food for the world at large has increased by 3 per cent per year while the population has increased on the average 1.7 per cent. In document No. 8148, the Department of State estimates that if individual consumption levels remained at the 1955–7 level, the world at large would show by 1975 an annual surplus of 40 million tons of wheat and 70 million tons of rice. (This estimate is based on the postulate that there will be no increase in rice production in Europe and North America, and no increase in wheat production in North America.) Actually, this slight but steady gain of food production over population is part of a secular trend. E. S. and W. S. Woytinski, in their monumental *World Population and Production*, estimate that, since 1850, the increase in output has been more rapid than the increase in population.

This writer is a nutritionist who has worked in poor countries in Asia and Africa; he is, therefore, well aware of the widespread character of malnutrition. Caloric undernutrition is still found in many parts of the world, and not always as a result of war or civil disorder, great natural catastrophes such as earthquakes or floods, invasion of insects or other parasites, and abnormally prolonged droughts. Protein deficiency ("kwashiorkor" when it occurs without accompanying caloric deprivation, "marasmus" when both caloric and protein intakes are inadequate) is seen in varying prevalence among the young children of most countries of Asia and Africa and in many of Central and South America. Vitamin A deficiency is perhaps underestimated as a threat to the life—and the sight—of children of most of the same areas where protein deficiency is also seen. Riboflavin deficiency, thiamine deficiency (beri-beri in its various forms), and a number of other deficiencies are still very much with us. Still, there is no evidence that the situation is getting worse. The food balance sheets on which post-war pessimism was based are imperfect instruments. When this writer was nutrition officer of FAO, he spent considerable time attempting to gauge such unknowns as figures for wasted food at the retail level and within families and figures for that portion of the food supply which does not move within the channels of trade (the food grown by the farmer for his family is very inaccurately known, particularly as regards fruits and vegetables), which tend to be underestimated. The nutritional standards against which available supplies are themselves being refined are imperfect. As the results of additional experimental and clinical work become available, it is realized that a number of such standards—those for protein and calcium among others—were probably unnecessarily high. Even without such re-evaluation, the evaluation of food balance sheets—the only instruments we have to judge the race between food and population—make it apparent that most regions do show the same slow increase of per capita supplies exhibited by the world at large. It must be realized, of course, that many of the worst nutritional scourges of mankind historically have been due as much to ignorance and to callousness as to lack of nutrients as such. Thousands of children die of protein deficiency in areas where the proteins which would save them do in fact

exist and are often consumed in sufficient amounts in the very households where infants and toddlers die for their lack: faulty understanding of the child's needs may be the main cause of his being denied some of the food consumed by his father and older siblings. Man's inhumanity to man and its contribution to starvation could be illustrated by thousands of examples: cereals being shipped from Ireland under the protection of naval guns during the famine; stocks being withheld during the Congo famine to keep prices up; the systematic starvation of the Biafran people.

Certainly, as far as food is concerned, ours is not one world. The United States government rents twenty million acres from our farmers so that they will not grow food on them. A recent study at Iowa State University suggests that sixty-two and a half million acres ought to be similarly retired so that surpluses will not continue to be created in relation to the present market. Australia, Canada, New Zealand, Argentina and France have been, or are at present, involved in similar efforts to restrict production.

Nor is this idling of food production restricted to highly developed countries. A recent study estimates that Ghanaan farmers work only an average of two hours a day in the cocoa area, the wealthiest agricultural area of the country.

The fact is that the greatest increases in agricultural production (and even more so the greatest *potential* increases) have taken place in the developed rather than in the underdeveloped countries. In many ways, the world food balance sheet is vastly more favorable than that of the most needy continents making entire subcontinents such as India increasingly dependent on a consortium of developed countries. But I believe it is fair to say that in most areas of the world, the race between food and population would be more favorable to the development of adequate nutrition if the rate of population growth were decreased. There is no ground for stating in 1968 that the nutritional state of the world is getting worse. It is not. And I believe that improvement in communication, availability of surpluses in some countries, the existence of solid international organizations and the gradual improvement in international morality make large-scale famines not due to war (such as the Irish or the Bengali famine) less likely to occur in this era, except perhaps in Red China because of its alienation from the two richest blocks of countries. (It appears, however, that the food situation in China has improved noticeably in the past two years, making the reoccurrence of famine there more remote.)

The present, bad as it is, is no worse than the past and probably somewhat better. But what of the future? In absolute numbers, the increase in population is likely to accelerate for some time. Can the food supply keep up? My contention is that, for better or for worse, it can and will.

First, let us consider conventional agriculture. FAO's figures indicate that 3.4 billion acres are at present under cultivation. This represents less than 11% of the total land area of the world. A number of experts—Prasolov, Shantz, Zimmerman—estimate the area which can eventually be arable from 13 to 17 billion acres. Colin Clark, the Director of the Agricultural Economics Research Institute of Oxford, uses the figure of 19 billion acres, but counts double-cropped tropical lands twice. (He considers, incidentally, that if the land were farmed as well as the Dutch farmers work their acres today, it would support 28 billion people on a Dutch diet; if Japanese standards of farming and nutrition were used, this area would support 95 billion people.)

The biggest potential increase of food production does not, however, come from the extension of the area under cultivation but from the increase in use of fertilizers. The phenomenal increase in food produc-

tion in this country has actually been performed with a reduction in acreage farmed. By pre-World War I standards of cultivation, it took one and one half acres to support an American. If such standards prevailed today, we would need to add at least 40 million acres to our farm area every ten years, or the equivalent of an additional Iowa every decade. In fact, we use the alternative—fertilizers. One ton of nitrogen is the equivalent of fourteen acres of good farm land. Between two and three hundred thousand tons of nitrogen (and corresponding amounts of other necessary elements) per decade has, in fact, obviated the need to discover another Iowa. Neither is our use of fertilizers as intensive as it is in Japan (where it is well over twice that employed here) or in Western Europe. (Incidentally, in spite of its already high standards of cultivation, Japan is still increasing its agricultural production at a rate of three per cent per year.) India, Africa and most of Latin America use only an infinitesimal fraction of Japanese or Western amounts of fertilizer or use none at all. Garst has estimated that an expenditure of 10 dollars an acre for fertilizers per year would alone add 50 per cent to 100 per cent to the low yields in underdeveloped countries. Applying this to an area of 1.5 billion acres would be equivalent to adding at least 750,000,000 acres to the crop areas of these countries, the equivalent of a continent bigger than North America. It is interesting to note that this primacy of fertilizers has been recognized relatively late. In this country, this recognition dates back only to World War II and has accelerated since the Korean conflict. In Japan, it also dates back to 1950 or thereabouts. And the leaders of the USSR have only recently realized that a large scale increase in fertilizer output would be easier and more rewarding than the extension of cultivation to the "virgin lands."

There are many other advances in agriculture which have yet to be applied on a large scale. The identification of necessary trace elements and their incorporation into fertilizers and feeds has opened vast areas to cultivation and husbandry in Australia and elsewhere. Selective breeding of plants and animals has permitted the development of species with superior hardiness and increased yields, in some cases multiplied them by a large factor. In the greater part of the world, such work has hardly begun. Advances in animal health and nutrition have permitted the mass production of milk and eggs in indoor conditions on a scale which was unimaginable a few years ago. For example, the city of Los Angeles is now an important and efficient dairy area. In some large installations, computers programmed to calculate the cheapest method of providing a diet of known energy and known content in ten essential amino acids, total protein and other nutrients automatically set the controls which will mix basic staples providing the cheapest adequate diet as they are informed of the latest commodity prices. Herbicides increase yields. Pesticides prevent losses from rodents, insects and fungi. (In many underdeveloped countries, one quarter of the crops are lost before they reach the consumer.) Certain methods of preservation of foods by radiation have just been approved by the Food and Drug Administration. Control of weather by seeding clouds for rain, speeding cloud formation by heating lakes by atomic energy, desalinization of brackish water by various methods are entering the realm of practical feasibility.

Powerful though these methods of "classical" agriculture are, I believe that they will, within the lifetime of most present inhabitants of this planet, be left far behind as methods of food production. The general public is still unaware of these developments, their promise, and the extent of the means likely to be expended in the next decade in bringing research results to practical application. Large scale manu-

facture of food from petrochemicals started during World War II when the Germans manufactured synthetic fats to feed forced labor groups. These fats did not conform to desirable standards of taste or safety (they contained a high proportion of branched chain fatty acids not normally found in nature and probably not fully metabolized, and retained a petroleum-like odor). After the war, interest in "synthetic" fats persisted for a while during the years when it appeared that shortage of natural fats was likely to be protracted. During the fifties, little or no work was done in this field, but recently a number of the largest international oil companies have again become actively interested and pilot plants are now in operation. Fatty acids, triglycerides (the constitutents of our common oils and fats) and fully metabolizable simpler compounds, such as 1,3-butanediol, may soon be manufactured at very low cost for human food and animal feeds. While the promise of abundant and cheap atomic power, widely heralded for the morrow in the immediate post war period, has shown itself slow to be realized, abundant cheap atomic power is coming and it may well be that oil will become increasingly a raw material for food and plastics rather than a fuel.

As a potential purveyor of food, photosynthesis can be used much more efficiently in algae than in higher plants. With proper mineral fertilization and with the proper rate of removal of the finished products, one square meter may be adequate to support the algae production sufficient to feed a man. And the calories produced are for a large proportion—as much as one half—derived from protein; vitamins are produced in the bargain. A number of universities are working with a number of species, chlorella in particular, and again large industrial firms are becoming yearly more interested. The problems entailed in the passage from the theoretically feasible to the economically feasible are formidable, but their solution is likely to be hastened for an unexpected reason. Interplanetary travel of long duration and the organization of distant stations requires not only recycling of oxygen and waste water, it necessitates the fabrication of food and its integration into the recycling of oxygen, water and excreta. Over the next two decades, an increasing fraction of the several billion dollars which the United States and the Soviet Union will spend every year for space travel is going to be channelled into the life support systems. The money spent in the aggregate on new methods of food production will probably, during that period, dwarf the cost of the Manhattan project. In many ways, we may have in space exploration what William James called "the moral equivalent of war." We will probably have in it also the technological equivalent of war, without the corresponding losses in men and in resources. The usable fall-out of such research is likely to be enormous. Certainly if economical harnessing of photosynthesis—through biological units or directly—can be realized under the hostile interplanetary, lunar or martian conditions, it should become relatively easy to put it into effect on earth. All this is no longer science fiction. It is as much of a reality as the federal income tax. Obviously, a breakthrough in this field could remove food altogether as a limiting factor to population growth for centuries.

What should we do now to help underdeveloped countries? The measures which should be implemented are logical consequences of what I have said above.

We should develop massive research, education and aid programs aimed at developing better seed and animal varieties and better fertilizers for tropical countries as well as the types of agricultural extension necessary to "sell" them. And we should give assistance to countries to develop their own fertilizer plants and their

own repair and manufacture facilities for agricultural implements.

One of the tragedies of the post-war period was that the developed countries, particularly the United States and the United Kingdom, anxious though they were to improve the world food situation, were totally uninterested in furthering the industrialization of the underdeveloped countries, including the heavy chemical industry, basic to the manufacture of chemicals, and the steel industry, basic to the manufacture of tractors, multiple plows and other appliances. The underdeveloped countries were expected to improve their subsistence agriculture gradually, buying the essential tools and fertilizers out of the proceeds of the sale of ores and other raw materials to the United States and other developed countries. Even today, there is more interest in providing these countries, India in particular, with cheap or free agricultural "surpluses" (which in the long run further depress the price which the local farmer gets for his produce and discourage him from raising his production) than in helping them to become truly independent nutritionally by allowing them to industralize quickly in the areas most useful to agriculture.

It is high time that we reversed this trend. Unless we do so, we shall either drive countries which need this help into the waiting arms of hostile regimes or we shall continue to have them be dependent on us. It is paradoxical that the countries most in need of food aids are the very countries where the enormous majority of the working population are farmers. One of their handicaps has been the low prices which they get for their produce, and the high cost of agricultural implements. To continually dump free agricultural commodities on their internal market as an "aid," while neglecting to assist them to develop an industry ancillary to agriculture, is the last thing that can help them.

Granted, such a policy will not help us to decrease our surpluses (only a small fraction would be used, for real emergencies brought about by war or by natural catastrophes), but then we need a complete review of our system of agricultural subsidies and price controls anyway. (Butter is no use as relief since recipient countries do not have the refrigerating facilities necessary to use it, and its overconsumption in this country is associated with our ever-increasing mortality from cardiovascular diseases; yet, we continue to pile up surpluses of butter because of obsolete agricultural policies.)

We should also be alert to the possibilities of development of new foods and of non-conventional sources of food and encourage research designed to make sure that new processes can be applied quickly within underdeveloped countries.

I have spoken so far of the poor as though they were all to be found in poor countries. Unfortunately this is not so. As one of the original members of the committee which launched the studies on Hunger USA and as one of the conveners of the October 16, 1968, Washington, D.C., Conference to study legislative and other measures designed to eliminate malnutrition among our poor, I would be the last to forget that we, too, have problems of nutrition and poverty. The hearings conducted by the Board of Inquiry into Hunger and Malnutrition in the United States revealed that there was widespread malnutrition in our country. The actual extent could not be determined by the Board which was not equipped to conduct epidemiologic surveys. A great deal of the evidence was anecdotal: laymen cited personal experiences or isolated observation; I am sorry to say that the testimony of physicians all too often betrayed both the poor quality of nutrition teaching and the lack of statistical training which still characterize our medical schools. Still, any person, knowledgeable and of good faith, who reads the proceedings of these hear-

ings is bound to be impressed with the fact that we have large groups in this country who are badly in need of nutritional help.

To give them this help has been difficult. Perhaps as many as half of our counties have no food stamp or commodity distribution program. The Secretary of Agriculture has appeared all too often unwilling to recognize the severity and the scope of the problem and to use the authority vested in him by law to eliminate any payment, to give food stamps to the families who need them, or to push vigorously for an extension of the number of countries covered or of the types of food distributed.

I have said earlier that, if the research now in progress on synthesis of food from oil and in harnessing photosynthesis from algae is successful, food could be removed as a factor limiting population growth. I hasten to say that I do not consider this possibility an unadulterated blessing. In a sense, the conservationists and social scientists who have claimed that the ultimate nutritional disaster was at hand have been living in a fool's paradise. The latest (1968) figures of the Food and Agriculture Organization showing a 6% increase for this year in the food available per caput illustrate this fallacy. Does anyone think that, because food supply has more than kept up with population growth in the past year, the dangers of overpopulation have receded?

The case of the United States, a country which we have seen is exactly average in terms of population density though not in amount of food available per person, is another striking illustration of the fact that it is a mistake to predicate the need for a population policy on nutrition. Our population is increasing faster than it ever has; our major nutrition problem is overweight; our major agricultural problem is our ever-mounting excess production. Does anyone seriously believe that this means that we have no population problem? Our housing problems, our traffic problems, the insufficiency of the number of our hospitals, our community recreation facilities, our pollution problems—all are facets of our population problem. I may add that, in this country, we compound the population problem through the migratory habits of our people from rural farm areas to urban areas and, in particular, to "metropolitan" areas (212 such areas now have 84% of our population); from low income areas to high income areas; from the East and Midwest to the South and Southwest; from all areas to the Pacific coast; from the center of cities to suburbs which soon form gigantic conurbations; and circumstances have pushed our Negroes into the deteriorating centers of our large cities. All this has occurred without any master plan with public services continuously behind both growth and migrations.

Let us conclude with one specific example: 4 million students sought enrollment into college in 1960. The Bureau of Census estimates that 8 million will do so in 1970, 10 million in 1975, and 12 million in 1980. No one questions our ability to feed these youngsters. But are we as a nation at all prepared for a tripling of the size of our colleges and universities in 15 years? We need a population policy and we need it soon, for the United States as well as for the world at large, not because we cannot step up food production, but because we believe, like Plato and Aristotle when they considered the problem of the ideal population (respectively in *Republic* and in *Politics*), in trying for excellence rather than in rejoicing in numbers and because excellent human beings cannot be produced without enough housing, hospitals, educational opportunities, room for recreation and, thus, many resources besides food. (Rich people in tropical countries tend to have "American" rather than "tropical" problems.)

We can, therefore, conclude that the nutrition situation is only one of the elements

which direct that we develop a world-wide population policy and that we develop it soon. While it is obvious that the more crowded, underdeveloped countries are particularly in need of a widespread and energetic birth control policy [which for ideological reasons which I have studied elsewhere (2) should be, particularly in Socialist countries with a strong anti-Malthusian tradition, based on the concepts of ideal family size and liberation of women rather than on national population limitation], the problem is far from being unique to these countries but extends in many ways to the West, Japan and the United States even though there nutrition is a secondary consideration.

The Rich

When we go now to developed countries, and particularly to our own, we run into nutrition problems which in some ways threaten to become as serious. In considering the increase of our health expenditures and of the insignificant results we seem to have obtained, we are led to a profound reappraisal of our medical practices, the relative importance of preventive medicine and nutrition to curative medicine and to an indictment of our present mode of life and of the trend of present day American civilization.

In a recent study (3), W. H. Forbes points out that medical care is tied with agriculture as our second largest industry, exceeded only by construction. Specifically, in 1966 the American people spent 44 billion dollars in medical care. This compared with a total of only 11 billion dollars in 1949. Furthermore, if present trends continue, by 1970 medical care may be the largest consumer of manpower.

Surely with expenditures of this magnitude both in money and men we may expect impressive results. In fact, as W. H. Forbes points out, we are certainly getting "health services" for our 44 billion dollars but in terms of what people expect from these health services—longevity, health and happiness, or, as they are often expressed in the negative, post-ponement of death, freedom from discomfort and disability, and freedom from apprehension and worry—the results are much more doubtful. The last two quantities are difficult to measure or to evaluate, hospital days or absenteeism being influenced by cultural attitudes, prevalence of prepaid medical care, differences in diagnosis; therefore, longevity is the easiest yardstick to use and, incidentally, lends itself best to international comparisons. The sad fact is that the United States is essentially the only country (for which good statistics are available) which shows no increase whatsoever in life expectancy of men (the picture for women is more favorable), with the effect that our average remaining lifetime for men at age 40 has slipped from eleventh place in 1949 to thirty-seventh place in 1966.

The United States also shows an enormous difference in life expectancy between men and women (8 years, as compared with 3.4 years for the leaders). The poor showing of the United States is probably not entirely related to our somewhat chaotic organization of medical care; medical care for men and women is similar in this country and our women, though behind the leaders in average remaining lifetime, are close to them. For example, at age 10, the ARL for U.S. women, though eleventh in the world, is only 1.1 years behind the leading country (Iceland) while our men at the same age are thirty-first and 4.5 years behind the leader (Norway). Similarly, the disparity in medical care between various segments of the population cannot account for the poor showing of our men. If the white population only is considered (the life expectancy of our Negro citizens though improved—it was 14 years less than that of the whites in 1900 and is now 6 years less—still lowers somewhat the life expectancy of the population), our women

are almost level with the leaders, but our men are still several years behind the leaders. The only conclusion that can be drawn is that the life expectancy of U.S. males is shockingly poor. (The fact that our statistics of mortality for the very young and the very old are reasonably satisfactory emphasizes that our big problem is with the adults and, in particular, with the middle-aged.)

We do have a high mortality from violence—several times the death rate from automobile accidents, from home accidents and from industrial accidents, and 10 to 20 times the rate from homicides of leading developed countries. We also have a high—and growing—death rate from lung cancer. Still, as compared to our main cause of death—cardiovascular disease—other factors are minor. The fact that almost half of our men in the 40 to 60 year range die of cardiovascular disease (with coronary heart disease preponderant) means that we have returned unwittingly to the days of the great pandemics when a quarter or a half of the population died of one disease. This time, the pandemic is one of a degenerative rather than of an epidemic disease. As in the case of the great plague of 1348 which took at least 43 million lives in Europe, the reason for this disaster must be looked for not only in the biological but also in the sociological realm.

There are a number of factors involved in the enormous prevalence of cardiovascular disease in the United States, all of these factors having important social connotations. The role of some of these factors—hypercholesterolemia, obesity, untreated hypertension, lack of exercise, cigarette smoking—is well established. Hypercholesterolemia is related to a high fat diet (and lack of exercise); obesity, to our mode of life (and particularly our lack of exercise); hypertension, to our national habit for excessive salting of the diet (and, according to recent results, perhaps to lack of exercise as well). Our lack of emphasis on preventive medicine means, of course, that in a very large proportion of our population, hypertension is unlikely to be picked up until it becomes symptomatic, by which point it has already seriously damaged the cardiovascular system, or on the occasion of the treatment of another condition.

Lack of exercise acts unfavorably on our cardiovascular system in a number of ways over and beyond the association with obesity, hypercholesterolemia and hypertension. Cigarette smoking is a recent characteristic of our society. Its effect on fitness is, of course, less apparent in individuals who do not have to push themselves physically. The role of two other factors is less well established, although recent works suggest that they may have been overlooked too long: one is coffee drinking, which appears to be statistically linked to coronary disease, as well as, it appears, with unfavorable effects on carbohydrate metabolism (4), although the association is made unclear by the fact that heavy coffee drinking in our society is usually also associated with heavy cigarette smoking; the other is insufficient sleep, which is probably somewhat linked with insufficient exercise and also probably accentuated by the universal prevalence of television and the national taste for late shows.

Early work on the relationship of serum cholesterol and exercise in chemicals yielded equivocal results, perhaps because the exercise was not intense or prolonged enough (5). More recent work with rats has shown that exercising on a treadmill for a sufficient duration five times a week significantly decreases their blood cholesterol (6). In man, a number of studies have demonstrated that very hard, prolonged physical work at a level probably difficult to achieve in urbanized Western societies does lower serum cholesterol levels even in subjects consuming a high-fat diet.

Karvonen and co-workers (7) studied the food consumption of lumberjacks in five camps in Eastern Finland. These men had an extremely large average daily intake, over 4700 calories, of which no less than 45 per cent were derived from fat. Yet their serum cholesterol levels were no higher than that of the average Finnish man with a much lower caloric intake, only 35 per cent of which is derived from fat. Gsell and I (8) compared an extremely active Swiss village population with an urban Swiss population. The village population had a high fat intake and a daily caloric intake 1000 calories higher than the urban population. However, the serum cholesterol levels of both men and women on the high physical activity and high-fat intake regimen were significantly lower than those found in their urbanized countrymen. It is thus apparent that the problems of diet and exercise are interrelated as regards hypercholesterolemia (and, hence, coronary heart disease). An unexercised man appears far less able to tolerate the diet high in fat and high in saturated fat which is habitually consumed by our physically inactive population.

I have mentioned the fact that hypertension is an important factor in the etiology of cardiovascular disease. While there had been hitherto little work done on the relationship of blood pressure and exercise, recent work indicates that daily exercise of sufficient duration has a favorable effect on blood pressure, over and above that brought about by weight reduction. A study by Dr. Ernest Jokl of the University of Kentucky Medical School (personal communication), soon to be published, will show that a highly significant number of individuals were removed from the high risk category after following an intensive program of physical conditioning for several months.

The first documented evidence on the protective effect of exercise against heart disease was the well-known study of Morris and co-workers (9). The British investigators found that London bus drivers showed a higher incidence and a greater severity of coronary heart disease than did the bus conductors, who in the two-level London buses do a great deal of stair climbing in the course of a day. The nutritional habits of the two groups were essentially identical and it seemed that the two main variables differentiating the two groups were the greater exercise of the conductors and the possibly greater stress associated with driving in the London city traffic.

A later study by Morris (10) compared rural mail clerks and rural delivery mailmen. In this case, the element of stress was eliminated and the protective effect of exercise appeared clearly. Mortality from coronary disease was significantly less among the walking than among the sitting mailmen.

A study by Taylor and co-workers (11) in this country gave similar findings. They studied railroad employees, a group remarkable for its stable employment. Union rules are such that it is highly desirable for an individual to stay in his particular line of employment throughout his working life lest he forfeit his seniority. As a result, whatever job switching is done tends to be done early in a man's career. Taylor and associates studied three groups: clerks, switchmen and section hands. They found that mortality from arteriosclerotic heart disease was inversely correlated with the physical activity characteristic of each class of work. It was 5.7 per 1000 for clerks, 3.9 per 1000 for switchmen, and 2.8 per 1000 for section hands. The difference in mortality from arteriosclerotic heart disease among groups, in the same order and significance for all age groups, increased with age up to the 60 to 64 year old group. Clerks showed a death rate of 10.4 per 1000, switchmen 6.7 per 1000, and section hands 4.2 per 1000. While there are minor difficulties in interpretation, such as higher

death rates from violence among section hands and more rural locations among section hands than among switchmen and clerks, it seems unlikely that these would invalidate the general conclusion that daily exercise of sufficient duration and intensity decreases mortality from coronary atherosclerosis.

I am strongly convinced that the medical profession has not paid enough attention to the very basic work of Richard W. Eckstein (12) on the effect of exercise and coronary artery narrowing on coronary collateral circulation. This work, which has recently been reproduced and extended by Dr. Bernard Lown and his associates in our nutrition department at Harvard University School of Public Health, established clearly that exercise may favorably affect the course of coronary artery disease by one or more of several means. It may actually delay the progression of the disease or stimulate the growth of coronary collateral vessels during the disease process, or both.

Eckstein's study involved operating on 117 dogs and isolating the circumflex artery near its origin. Ligatures were tied over a probe to produce various degrees of constriction, causing T wave inversion and S-T segment depression before the probe was removed. After removal of the probe, return of the T wave and S-T segment to normal or nearly normal indicated patency of the narrowed vessel. After closing of the chest, air evacuation from the pleural cavity, and three days of rest with penicillin therapy, the dogs were divided into two groups, both groups being kept at rest for one week to allow healing. One group was then exercised on a treadmill placed at a positive incline of 30 degrees. During the first week the speed was gradually increased from 3.2 to 4.7 mph. The animals were exercised from 15 to 20 minutes, four times daily, five days a week for six to eight weeks. During this period the second group remained at rest.

Examination of collateral function, through measurement of retrograde flow previously shown to be proportional to the anatomic development of the collateral vascular bed, showed clearly that in general the extent of collateral blood flow was proportional to the degree of constriction. It was clear that exercise increased the extent of collateral circulation by a very marked amount over and above that due to narrowing alone. The absence of electrocardiographic changes of complete circumflex occlusion, shown at the end of the experiments in exercised animals with high retrograde flow, clearly demonstrated the functional adequacy of these channels.

Significant collaterals did not develop in the rested animals with slight circumflex narrowing. The retrograde flow was low, and if complete circumflex occlusion was effected at the end of the experimental period, the electrocardiographic changes resembled those following complete circumflex occlusion in normal dogs.

The preparations from this study appeared comparable to human beings with coronary disease limited to one major artery or with severe narrowing of one major artery and limited narrowing of other arteries. Evidence obtained in the study of anastomoses in the heart of anemic patients also suggests that Eckstein's models are valid for man (12). It seems, therefore, highly likely that in man, as in dogs, under conditions of mild arterial narrowing, the myocardium is susceptible to infarction subsequent to sudden vascular occlusion because adequate collateral vessels are absent. Vascular occlusion through thrombosis or through hemorrhage into the vascular wall is more likely to develop in patients with a small degree of narrowing of a main coronary artery than in individuals with large, elastic arteries.

The experimental results reviewed here

strongly suggest that during the early stage of the atherosclerotic process, exercise may be of particular value in promoting the growth of collateral vessels. Inasmuch as most middle-aged American males appear to be in this early and, at present, invisible stage of the disease, it appears imperative to encourage asymptomatic middle-aged men to exercise. Through a program of exercise falling just short of anginal pain, collateral circulation may also be developed in patients who have had a recent coronary attack. While the benefits of surgical therapeutic measures may be desirable in certain cases, it would appear that a program of exercise started early enough and properly conducted might make other curative measures unnecessary in many cases.

First of all, it must be recognized that "exercise" is a vague term. Different kinds, intensities and durations of exercise accomplish very different results:

Moderate exercise. Some type of moderate exercise, particularly walking, should be pursued every day for a sufficient time, e.g., one hour. This is essential for maintaining body weight, especially in mesomorphic or mesomorphic-endomorphic individuals.

Limbering, coordinating and strengthening exercises. Although useful in training young people, such types of exercise are probably of less significance as far as health is concerned. Exercises strengthening the back and stomach muscles do have orthopedic significance and are useful in the prevention of "low back pain."

Constant vigorous physical labor. This type of activity for 10 hours a day, obviously incompatible with the mode of employment of most Americans, appears to permit individuals to handle a diet high in saturated fat without the usual increase in serum cholesterol. It also appears to be beneficial in regard to elasticity and patency of the vessels of the heart and is associated with a smaller mortality from coronary atherosclerosis.

Exercise considerably increasing work of the heart. If properly spaced, exercise of sufficient intensity to increase considerably the work of the heart will train the cardiovascular system. The intensity does not need to approach the maximum energy expenditure. Under extreme conditions, a portion of the energy breakdown comes from anaerobic processes, with little immediate benefit as far as the cardiovascular system is concerned. While anaerobic training is of value to the athlete competing in sprint-type events, it is not indicated for the middle-aged man in need of conditioning.

The nature of this relatively intense exercise is of some importance in that, as equal energy expenditure, the strain on the heart (as measured by increase in pulse rate and blood pressure) is greater if the work is performed essentially by the arms than by the legs. In other words, an untrained man, faced by a sudden demand for a greatly increased rate of energy expenditure, is in much greater jeopardy if he is shoveling snow than if he is running for the bus. The explanation for this all too often ignored fact lies in the construction of the body: the supplying of blood to the arms is performed through smaller vessels than those supplying blood to the legs; hence, an equal rate of energy forces the heart to pump more often under greater pressure. This fact is of little import in a well-trained young athlete, but becomes crucial in an untrained middle-aged man with an atherosclerotic heart.

In practice, while younger men still in good condition may be encouraged to build up their practice of intense exercise to a half hour daily, with an expenditure approaching the rate of 7000 calories per hour, Swedish results show that three or even two fifteen minute periods of intense exercise a week, together with a daily hour

of walking are sufficient to improve cardiovascular fitness to a considerable extent.

Life insurance studies have clearly demonstrated that obesity is accompanied by increased mortality from a number of degenerative diseases, in particular cardiovascular diseases. Dublin and Marks (13), of the Metropolitan Life Insurance Company, deserve particular credit for establishing incontrovertible evidence of the association of obesity and disease. They have shown statistically that obese persons who reduce and stay reduced may substantially increase their life expectancy. Yet, at the same time, it is highly probable that the link between obesity and disease is more complex than the simple cause-and-effect relationship often suggested. To be sure, the excess fat in some persons is obviously dangerous per se. It increases surgical risk by making administration of anesthesia more delicate and causing operations to be performed through layers of fat. It increases the probability of hepatic disease whenever it causes actual fatty infiltration of the liver. Increased mortality from accidents can be attributed to the fact that the obese person is a larger, clumsier and slower target as well as a poorer surgical risk after the accident.

On the other hand, it is likely that in many cases the relationship between obesity and disease is associative as well as causative. Insurance tables (13) indicate that, while most correlations between causes of death and obesity are positive, there are two causes of death which are negatively correlated with obesity: suicide and tuberculosis. In fact, it has been shown that the lesser mortality from tuberculosis in obese patients is not an artifact due to the decreased food intake of patients with a prolonged infection. Long-term studies (14) have shown that overweight persons are less prone to have tuberculosis. Incidentally, the decreased incidence of tuberculosis in overweight persons may explain why stoutness was so long equated with health in the Western world. (This is still the popular view in many underdeveloped countries.) Similarly, a causative relationship obviously is ruled out for the association of overweight with a decreased mortality from suicide. Apparently, the physical and psychologic characteristics which favor the development of obesity do not favor the development of the suicidal state.

Nonketotic diabetes in middle-aged obese patients is an illustration of the complexity of the association of obesity and disease. This syndrome probably entails associative factors (both hyperphagia and diabetes may result from the basic impairment in metabolism of carbohydrate) as well as causative factors. The "lipoplethoric" state of adipose tissue undoubtedly contributes to the deterioration of the glucose tolerance, which is generally improved by weight reduction. The relationship of obesity to heart disease may well be even more complicated. By exerting pressure on the capillaries, excess fat may cause increased peripheral resistance to flow; it may impair the function of the heart, because the heart itself is infiltrated with fat; and it may increase the work of an inefficient cardiovascular system because of the extra weight to be moved. Obesity and deficient cardiovascular function both may result from a sedentary, sluggish mode of life and from excessive consumption of an atherogenic diet.

It also is likely that the relationship between obesity proper, i.e., excessive adiposity, and disease has been obscured by the fact that the insurance tables which provide the bulk of available data were established in terms of body *weight,* not body *fat.* Selected "overweight" groups, such as the California longshoremen studied by Buechley, Drake and Breslow (15), have a favorable health picture. Similarly, the association of obesity with endomorphy and mesomorphy and the striking negative correlation with ectomorphy that C. C.

Seltzer and I demonstrated (16) is a complicating factor in interpreting the association of obesity and disease. We know that coronary disease and hypertension are associated with mesomorphy and endomorphy and are negatively correlated with ectomorphy so that obesity may to a certain extent be "blamed" for what is a body type effect. In spite of these complexities it is reasonable to conclude that the relationship of obesity and disease is sufficiently close to allow obesity to be considered a serious menace to health. We may add that it is through its effect on the cardiovascular system that obesity is most dangerous to health.

It is probably unnecessary to review in any detail the evidence that a diet high in saturated fat is conducive to hypercholesterolemia and that, in turn, an increase in the level of serum cholesterol in a population is correlated with an increase in coronary disease. In this country, the 1962 Framingham study (17) demonstrated that the incidence of coronary heart disease in men aged 30 to 49 with a serum cholesterol of 260 mg. per 100 ml. or more was more than five times greater than the incidence in men in the same age group with a serum cholesterol below 200 mg. per 100 ml. The long-term 1963 study at the Western Electric Company at Chicago (18) similarly showed a good correlation between serum cholesterol level and the development of coronary heart disease. The 1966 People's Gas Company study (19), also conducted at Chicago, yielded an approximately linear increase in the incidence of new clinical coronary heart disease with the serum cholesterol level.

This evidence is supplemented by similar results obtained in other developed countries. For example, the 1965 study of Jewell *et al.* (20) demonstrated that the cardiovascular mortality in three areas of the country varied with the serum cholesterol. A three-year follow up of close to 7000 men in Oslo published in 1966 showed a good correlation between morbidity and mortality from coronary heart disease and serum cholesterol level. Norway, incidentally, is a country of special interest as regards the relationship of dietary fat and cholesterol level because Norwegian medical scientists followed closely the changes in coronary heart disease and the changes in dietary fat as the time went on in the last twenty-five years. Under the Nazi occupation, dietary fat was severely curtailed; then, as the country was liberated and dietary restrictions were removed, the fat level steadily increased. Westlund, in a 1965 study (21), showed that the number of male Oslo residents aged 55 to 64, discharged from five internal medicine departments of Oslo hospitals with a first diagnosis of myocardial infarction, corresponded to a rate which increased from 9.0 per 10,000 in 1945 to 64.9 per 10,000 in 1961. It is in Oslo, incidentally, that what is probably the best of all studies showing the favorable effect of a diet where saturated fat and cholesterol were reduced as much as practical, and the consumption of polyunsaturated fat increased (by restricting meat as much as possible and eliminating fat, replacing beef, mutton and pork by whole meat and poultry, increasing the consumption of fish and shellfish of all types, eliminating whole milk and cream and recommending skim milk, eliminating butter and fat cheeses and encouraging the consumption of low fat cheeses, limiting egg yolks to a maximum of one a week, eliminating bread made with whole milk, increasing low fat bread and cereals served with skim milk, eliminating lard, shortening, and olive oil and recommending soybean oil (other oils high in linoleic acid would do as well; sardines in cod liver oil were another means of insuring a high intake of linoleic acid) was published in 1966 by Paul Leren (22). In this study, the effect of the experimental diet on the coronary

heart disease relapse rate was studied for 5 years in a group of 206 male patients with a previous infarct and the results compared to those obtained in a group of 206 similar patients allotted to the group in randomized fashion and well matched with the experimental group. Cholesterol levels were markedly lowered (17.6% on the average) in the experimental group. In particularly conscientious dieters, reduction in serum cholesterol exceeded 30%. While the incidence of sudden death was the same in both groups, only one-third as many patients on the diet acquired angina during the observation period. Of these, two of the "dieters" and nine of the controls had second infarcts. In the diet group, 34 patients had 43 reinfarcts, 10 of which were fatal. In the control group, 54 patients had 64 reinfarcts, 23 of which were fatal. Including strokes and aortic thrombosis, mortality was 38 in the diet group and 52 in the control groups. Of particular interest are the facts that the correlation of cardiovascular relapse and blood pressure, marked in the control group, almost disappeared in the experimental group, and that the response to diet was particularly marked in individuals under the age of 60.

The Necessary Action

It should be obvious from what I have said that there are a number of actions which ought to be taken immediately, if we want to reduce our horrendous cardiovascular mortality.

1. We need to have no less than one hour of daily physical activity for all our students, starting in kindergarten and going through college and the graduate and professional schools. At present, we have physical education programs only for our school children and in some colleges for freshman.

This means that we have to have a massive increase in school facilities. In a nation as rich as ours, if we don't squander our resources on unnecessary wars and unnecessary cars, it should be possible to have a swimming pool and indoor tennis courts as part of every high school, every large dormitory, every medical school and law school. A massive effort at recruiting and educating physical education teachers and monitors is necessary.

2. We need special programs for the obese and the unfit. To date, the activities of the President's Committee for Physical Fitness have been nothing short of farcical. We are as a nation putting all our attention on athletes, none on the kids who need attention most. My group has demonstrated in our work in Newton, Massachusetts, that it is possible to have a daily physical education program for the obese in the public schools, move them and reduce them.

3. We need to emphasize in our programs those activities which people can continue to do after they are out of schools. I am willing to believe that team sports have some educational value; many kids like them and should be able to play them. But I believe it essential to have them exposed to hiking, tennis, golf, swimming, squash and other activities they can continue to do on their own.

4. We need vastly expanded community sports facilities for adults. These can include many of the school facilities in the evenings and on weekends.

5. We must rebuild our cities so that walking becomes a pleasure. Cities for people to walk and live in, rather than for cars to be parked in are an urgent public health necessity.

6. We must do something about the diet of our poeple, by encouraging manufacturers to use polyunsaturated fats rather than saturated ones, by making compulsory (rather than discouraging) the labeling of kitchen and table fats and oils as regards polyunsaturated fats and by modifying

our military, industrial and school meals to conform with our modern knowledge.

Conclusion

I hope I have said enough to demonstrate that nutritional diseases, like other diseases, are a function of the state of civilization. A constant error of laymen and of not a few physicians is that there are *n* diseases and after a number of years, when the "cures" of *p* diseases have been discovered, there will be *n-p* diseases. The fact is that by then there will be an unknown number of diseases with some of the previously existing ones having disappeared spontaneously (as European leprosy did after the 14th century) and new diseases appearing as a result of a changed mode of life (in this century new causes of death include automobile accidents, radiation sickness, lung cancer in women; cardiovascular deaths have shown such an explosive increase as to make it a new *major* cause of death).

At present, we are at a curious crossroad of our civilization. On the one hand, we are cutting down on foreign aid nutrition programs, destroying crops in South Vietnam, countenancing undernutrition in the rural South (and, for that matter, malnutrition in the urban slums), and being half-hearted about birth control programs. On the other hand, we are taking no official action to change the food habits of our overfed, underexercised citizens so as to increase polyunsaturated and decrease saturated fats or to promote meaningful fitness programs (and adequate facilities) to cut down on the mounting pandemic of cardiovascular disease. The medical profession should take the lead in coping with the greatest health problem of our time.

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Planning for Community Health[1]

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OUR Health Care System has evolved as a response to poorly stated needs of an affluent society willing to pay piece-work rates for discontinuous service (1). Starting with that bald indictment, let me list some of the specific problems that now afflict us. Then I will discuss the planning process, reflect on new trends in community health, and conclude with a prophecy for the future.

Costs

First on everyone's list of problems in the health field is cost. More properly it can be called a symptom, but the fact is that medical costs are increasing at almost twice the rate of increase of our gross national product. In 1955, our total national health bill was $17 billion. This year it will surely exceed $50 billion. Long before 1975, it can be expected to hit $100 billion annually.

Gaps

Despite these vast expenditures, gaps exist in our delivery system. Some 30 to 40 million people, more than voted for either Humphrey or Nixon in the recent election, have grossly inadequate health care. Most of these people live in core city or rural settings. The Philadelphia Department of Health reported that the average age of white Philadelphians who died in 1966 was 71; for non-white Philadelphians, the average age was 62. About 9% of the white births in 1966 occurred without adequate prenatal care; 29% of the non-white births that year had inadequate prenatal care. Strange to say, each of the schools and colleges of medicine and its teaching hospital is located in an area of Philadelphia in which the infant death rate as reported in 1966 was about double the rate for the northeast section of the city, which has the lowest rate of infant deaths and lacks the advantage of a school or college of medicine (2).

Unfortunately, at the same time that our president and congress are defining health care as a human right, we find that our existing system cannot be stretched to include those persons not now covered. For example, the average doctor in the United States works 70 hours per week. To serve those not now touched by the system would require an additional 15 hours weekly. It seems obvious that the average physician neither would nor could routinely operate on an 85-hour week. "Our nation knows how to prevent illness and diagnose and treat disease. We have not yet learned how to organize to deliver these services to the consumer (3)."

Medicine has become categorized and fragmented. The industrial revolution has passed it by. It is still a cottage industry. We have failed to observe John Galbraith's dictum, "Organization is the natural consequence of specialization (4)."

Specialization has been a blessing for both society and physicians, yet its relevance and adaptability to society's needs in the real world must be brought under review. Dr. Kerr White has observed that in a given month, only one person in a thousand gets to a university teaching hospital. As we educate students, extrapolating from these particular cases to the general, we may be leaving great gaps in their understanding. Dr. Count Gibson has said, "Restricting education of physicians

[1] Arthur Parker Hitchens Lecture XII, The College of Physicians of Philadelphia, 25 November 1968.

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to a university hospital is like giving a forest ranger all of his education in a lumbar yard."

Common Errors of Commission

"Engine" Charlie Wilson used to say, "What's good for General Motors is good for the country." Encouraged by A.M.A. presidents who subscribe to this philosophy, planners for health delivery systems have worked on the same basis.

Small wonder then that the public is heard occasionally inquiring, "What have you done for *us* lately?" They are asking the same question of politicians, academicians, and tax-sheltered foundations. Is it possible that all of us are going to be asked to account for our stewardship of our public trust? The report is long overdue.

It has been said that the disenchantment of youth today springs from their perception of the gaps between what we as a nation espouse and what we do. We decry the Vietnam War and needless killing, yet tolerate an annual highway death toll that exceeds total Vietnam casualties to date. Scandinavians have shown that rigid enforcement of drinking-while-driving laws can decimate traffic fatalities. Conscientious enforcement of speed laws would save still more. Why are we permitting these needless deaths? We deplore unnecessary morbidity and mortality, while tolerating tobacco commercials which encourage our citizens to endanger their health! Untold sickness and suffering would be avoided if we stopped pushing the sale of tobacco. Why don't we stop?

I would like to quote to you from the sarcastic editorial entitled "The Valley of Decision," recently published in the American Journal of Public Health (Volume 58, No. 8, page 1317, August 1968). "The profession, like the nineteenth century family doctor, is called in after the patient is sick. In environmental control, that means after all the decisions have been made. Made by whom? By those who manipulate the land, . . . by developers, the automobile industry and its constituencies, the special interests in one or another commerical development.

"So it is that we bury our cities a mile deep in aerial manure. Then we note that chronic bronchitis, lung cancer, and emphysema rates go up. On these induced rates the *sickness* professions then project a need for case findings and chest clinics.

"We bury our cities seven feet deep in solid waste . . . we then count the rat population and we classify unhealthy children by their infirmities. We then propose a rat control program and improved pediatric services. In our cities there is enough noise, confusion, and frustration to drive a colony of saints crazy. The answer is bright, clear, and full of human purpose: we need more psychiatric services."

Our Planning Must be Changed

Do we need to plan? The answer is yes. Is this a problem that physicians alone can handle? No. Otherwise, Dr. Katharine Sturgis would have taken care of smoking and air pollution already.

Who does plan, then? If we are to avoid the General Motors' approach, we must involve a triumvirate of interests in any health system, those who will provide the care, those who will pay for it, and those who will receive it. Without the last group, who have heretofore been almost completely ignored, the first two operate in a vacuum.

Can we ignore the consumer any longer? Yes, if we want to exclude ourselves from the planning process altogether. Let me provide you an example. Here in Philadelphia the Area Wide Council is giving serious attention to the health needs of the Model Cities area. They have shown a refreshing ability to define the issues and have prepared a strategy which will solve their problem by stages on a priority basis. They have decided which elements to implement immediately, and which to delay until the results of the first moves

have been evaluated. By anyone's definition, that is planning. Consumers are demonstrating that they are at least our peers in approaching the task scientifically.

Consider the implications of all this. When citizens in the suburbs discover how effective a disadvantaged community can be in obtaining care, they will probably follow the same plan of action. There is wry irony in a situation where the reactionaries will themselves have to become the activists to reap the full benefits of living in our society.

Heretofore, the providers of care, particularly institutions, have had no rapport with those they served. But there are many reasons why now is the time to consider a changed approach.

Reflect for a moment on the establishment of the New Jersey College of Medicine in Newark. When the school negotiated unilaterally with the city for a large tract of land, the local community blocked their efforts to move in. When school and community sat down together to plan for common goals and bilateral benefits, the project was able to move with astonishing speed and outstanding success.

At Temple, our work with community leaders has been enlightening. One observed, "City Hall won't listen to you when you tell them your problems. You have no leverage, but they pay attention when we talk. We are voters, there are a lot of us, and we are getting organized. Too much money these days is being spent on law and order. The Feds are blowing a bundle on farmers and special interest groups. Not enough is being spent on common people. Let's take our case to City Hall, to Harrisburg, to the White House. We will work together to help you get the resources you need to care for us."

Community Planning

For four or five years we have been engaged in planning with our neighbors. We are still struggling to find better ways to communicate, to overcome distrust, and to work for common goals and purposes. These are a few of the experiences we have had in planning ambulatory care centers.

When we first approached Community Action Council D in the Hartranft area of Philadelphia with the suggestion that we apply jointly for funds to establish a neighborhood health center, we found something less than wild enthusiasm for the project. As we discussed together the major issues, the community quickly made it clear that their priority problems were jobs, housing, food, clothing, shelter for their families, and education. Health appeared somewhere down the list. We must conclude that medicine is a social science tied in with all of the conditions of daily life. We should also note a truth expressed by Nobel prize-winner George Beadle, who said, "... it has become abundantly clear that the only effective approach to problems in such a community is through urging the community itself to both recognize its problems and to take some initiative in attempts to solve them. Communities with serious social problems don't want solutions imposed from without; deep resentment is almost always the result (5)."

When the Community Action Council became aware of the fact that Office of Economic Opportunity Centers could also provide employment and training opportunities for disadvantaged persons in the neighborhood, they expressed a willingness to work with us. Initially, they declared their intent to tell us whom to hire, based on length of unemployment. When they understood these people would be working for them as members of the health care team, they agreed to help select only those whom they would want to serve them.

As we have worked with our neighbors, we have learned that disadvantaged communities are no longer willing to settle for rosy plans for the future or three-dimensional models of wonderful things to come. They now expect and demand prompt action and production of services;

however, they are inclined to be reasonable and will indicate priorities and accept short-term gains while the ultimately perfect solution is being worked upon. They, and we, believe the days of the charity ward, *noblesse oblige,* and paternalism should be ended in our health care systems. Our strength will develop from cooperative endeavors based upon peer relationships. The clear alternative is a divided society in conflict with itself.

To date, we, the purveyors of health care, have failed to meet fully the needs of society. Now that society is coming to us to request services to which they have become entitled, it is only reasonable to assume that they should play a large part in the control and direction of these new programs. As Dr. Martin Cherkasky said at the recent Association of American Medical Colleges meeting, "Intimate interrelationship with the community, and ultimately community control, must be achieved. There is only one point in favor of this process: it is essential (6)."

This implies that community and teaching hospital boards of trustees must also include representatives of all segments of society if hospitals are to fulfill their preeminent health role in their own communities. They must become more responsive to their clients—the patients—even if this means they are no longer purely doctors' workshops or the private domain of self-perpetuating boards of trustees.

Let us consider that the community has asked us to design neighborhood health centers as systems organized to increase production of comprehensive, family-centered, single-portal-of-entry health services. The team approach permits us to utilize scarce health manpower and provides opportunities for neighborhood citizens to obtain employment and training. The centers should offer an environment in which all health personnel can find satisfaction, fulfillment, and opportunity for self-improvement and upward mobility. So far, we have been successful in recruiting physicians, dentists, nurses, technicians, and social workers. We believe they come because of the social significance of the project. They also enjoy the advantages of working with a complete team in an ordered setting in an academic environment. For all, there is the opportunity for increasing professional skills on a daily basis, and winning the recognition and pay which is possible in a large organization.

At Temple we have had the same success others have enjoyed with employees recruited from the neighborhood and trained as members of the team. Let me tell you the story of how a neighborhood health worker in New York was successful in helping a tuberculosis patient remain in the health system. Sent out on a home visit, she was rebuffed by a closed door, and a voice within saying, "Go away. I don't want to see you." She knocked again, and this time explained her mission. Once more, she was dismissed, but again she rapped. This time from within came a voice saying, "Damn it! I don't want you bothering me." Now the neighborhood health worker's knowledge of the local culture came into play. She really hammered upon the door and said, "Don't *you* swear at *me,* you S.O.B.! Open the blankety door!" This time it swung open for her, and she completed her interview.

It takes the insight of a neighborhood health worker to explain to physicians that telling patients to take medicine after meals is impractical if the patient is too poor to eat more than once or twice a day. Taking a drug every three or four hours is difficult for the patient who has no clock to watch.

Our neighborhood health workers are trained to be patient advocates. I wasn't really sure they understood this role until

one called me and said, "Aren't you the director of this hospital who told us you were interested in patient care? If that is so, why didn't your hospital take better care of this patient of mine?" I was quick to investigate the incident, initiate corrective action, and send her a copy of the report.

Despite the fact that we know the large scope of services, both social and medical, will make the project expensive, we have taken every possible precaution to keep the cost of operating neighborhood health centers at a minimum. To begin with, O.E.O.'s last dollar financing mechanism creates, for all practical purposes, a prepaid, comprehensive closed-panel group practice. All of our physicians are salaried, and work full-time or at least half-time at the center. To stretch our dollars, we have contracted with hospital and medical school departments for services where it would be inappropriate to hire enough physicians to do the job well on our own account. For example, we have a contract with the Temple Department of Obstetrics which has assigned two physicians to our service who see patients in the centers and deliver their babies in the hospital. The Department, however, undertakes to keep our service covered twenty-four hours a day, seven days a week in support of the two assigned obstetricians.

Because our clinical departments are oriented to program budgeting, they are becoming quite cost- and profit-conscious. This will help the neighborhood center to conserve its resources. Unnecessary admissions will be held to a minimum because departmental physicians realize that they already have been paid for caring for our patients and have no opportunity to gain by admitting them to the hospital if they can be handled on an ambulatory basis. If they thus conserve a bed, they can bring in a patient from outside our project from whom they can collect additional revenue.

Our philosophy that the patient should receive whatever care is necessary in the most appropriate setting has led us to provide services in the home as well as in the more traditional ambulatory, referral, and inpatient facilities. Obviously, it is less expensive to manage a patient outside rather than inside the hospital. Wherever possible, we are using the individual least skilled but competent to provide the service, thus conserving highly trained and scarce manpower.

Still mindful of costs, we have organized our centers to operate from a single base of support, thus obviating duplication of effort. All administrative systems are compatible with those of the hospital. The information and record system is the same for both centers and will, we hope, be the one accepted for use by the five children and youth programs within the city. Consider the beauty of such a large confluent data base.

Research in patient delivery systems must be done quickly, effectively, and pragmatically. Our neighborhood health centers will provide, we believe, the laboratory within which many of society's problems can be identified and solved.

How does planning with consumers and with purchasers of care affect the shape and function of the hospital of the future? Let me list just a few of the ways in which Temple's new hospital will reflect "Triumvirate" inputs.

The community, and society as a whole, will be served through establishment of an in-house comprehensive community health center adequate to serve the total needs of an additional thirty thousand people. As a regional resource, our specialty services, inpatient and out-, will serve the discontinuous needs of a much larger group.

There will be no clinics, no duplication of services, no segregation on socio-economic or other grounds. Throughout the

building, we will offer a single, high quality of care. Temple will have no wards or semi-private rooms. All patients will, under all circumstances, be treated as "private" patients.

Physicians will function in "Program Management Divisions." Program directors will have authority, as always, but now they will carry responsibility and accountability for all of their decisions. Specialty and sub-specialty departments will be drawn together, eliminating some parochial rivalries and isolationist tendencies. Programs will be housed together on a single floor of the hospital, permitting interdisciplinary exchange, team practice, and economy of travel. All facilities for in- and outpatient care, teaching and research will have horizontal contiguity (7).

Those who pay for care have also participated in our planning process. The city health department expects to combine forces with us in providing more comprehensive services to our mutual clients. The state helped us design the group organization through which their patients do in fact receive private care.

Third party payers can be encouraged by the development of a system designed to give patient care where the patient's needs can best be met. Our system will not drastically reduce the cost of hospital care, but it should lower total costs by keeping patients out of hospitals. This has been the experience elsewhere. At Columbia Point in Boston, for example, inpatient days were cut by eighty percent after comprehensive ambulatory care became available.

Where Do We Go From Here?

If, in fact, we are successful in planning in collaboration with society as a whole, it is apparent that our entire system, including medical education, must change. The Association of American Medical Colleges, at its meeting in Houston on November 1 to 4, 1968, reached the same conclusion. These are some of the recommendations considered and "commended" to the individual medical colleges.

"The overriding recommendation is that medical schools must now actively revise the content and methods used in the total span of the education of the physician so that his professional competence will be most relevant to meeting the changing health needs of the people."

These additional recommendations were also made and approved in principle at that meeting.

1. Medical schools must increase their output of physicians. They should also make every possible effort to reduce their student attrition rate.

2. Medical schools must admit increased numbers of students from geographic areas, economic backgrounds, and ethnic groups that are now inadequately represented.

3. Medical schools must individualize the education of the physicians to fit the students' varying rates of achievement, various educational backgrounds, and differing career goals.

4. Medical school curricula should be developed by *interdepartmental* groups that include active participation of students. Curricula should be ratified by the faculty as a body rather than by individual departments. Dr. William Hubbard, a former president of the Association, in making his presentation, observed that departments are responsible for fostering their own realm of interests and seeking aggressively the maximum institutional support of their disciplinary goals. This essential responsibility is in natural conflict with the institution-wide responsibility for a curriculum that must change in response to changing community health needs. The most important impediment to curriculum change today is this conflict between disciplinary and institutional goals.

5. The medical schools must now as-

sume a responsibility for education and research in the organization and delivery of health services.

If communities become involved in the planning process, and if medical schools and universities begin to educate health professionals to meet the expressed needs of society, much progress will have been made. But more must come. The old divisions between public and private health must be obliterated, as functions merge in a total system combining city, state, and region, and the private, non-profit, and public sectors.

Public Law 89-239, the Regional Medical Program, Comprehensive Health Planning (PL 89–749), and its amendments, entitled the Partnership for Health, can, in their implementation, facilitate the creation of these systems. As Mr. Boisfeuillet Jones has said, "Organization must join the art and science of medical care if we are to achieve effectiveness, efficiency, and economy in the system (8)."

Dr. Herman Hilleboe maintains, "Nothing less than a massive reorganization of the entire health services of the country will free us from the administrative morass in which we find ourselves (9)."

I hope that we can find leadership to effect this reorganization, for we have no choice but to plan for an entirely new system of health services delivery. To remain true to our public trust, we must fight for the fulfillment of our social, scientific, and human goals in life.

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Centaurs of 2001[1,2]

By HILARY KOPROWSKI, M.D.[3]

PRESIDENT Wood, members of the College, ladies and gentlemen: From time immemorial, man's imagination has turned towards the supernatural. Apparently dissatisfied with his own image and with that of his fellow creatures—be they two-legged or four-legged, winged, or unwinged, talkative or silent, tame or ferocious—man's fertile imagination has created beings which were neither man nor beast, but which posssessed characteristics of both. Most of these creatures were endowed with supernatural powers. Some were godlike, such as the deities of the Egyptian pantheon whose human bodies were adorned with the heads of animals. The sky-god of the Upper Egypt, Horus, was hawk-headed. Sekhmet, the goddess of power, had the head of a lioness. Bastet, the cat-headed goddess, was appropriately worshipped as patroness of love, femininity and fashions.

Although many Egyptian deities, particularly those from the north, possessed a human head on a human body, the god of intelligence and learning, Dhowty (or Thoth), was always represented with the head of an ibis.

In addition to the high-ranking deities, Egyptians had many lesser deities adorned with hawk, jackal, and ape heads. With the exception of the Sphinx, who is a lion with a human head, all of these deities were represented with the body of a human and the head of an animal.

The Greeks went even further than the Egyptians. Greek mythology (1) contained not only numerous man-beast combinations, but also creatures representing combinations of three or more species. In addition, these creatures behaved like monsters and were endowed with the power to procreate monsters. Unions celebrated between various deities resulted in offspring even more frightful than the parents.

One such union deserves, perhaps, our special attention. One of the parents, Echidne, was half lovely woman and half speckled serpent (Figure 1). Her dwelling was a cave and her diet was raw human flesh. Her spouse was her uncle, Typhoon, son of Mother Earth and Tartarus, who from the thighs downward was a coiled serpent and had serpent heads for hands. Typhoon was ass-headed and winged, and hurled flaming rocks from his mouth. He drove the Greek gods from Olympus into Egypt. After a long struggle, he overpowered Zeus by severing the tendons of his hands and feet, and it took the cunning of Hermes and Pan to retransplant the divine tendons. Zeus finally finished Typhoon by burying him under Mount Aetna in Sicily. That Typhoon still lives is evidenced by the eruptions of the volcano.

Echidne and Typhoon begot several children: Hydra, the many-headed water serpent; Chimera, a triple-breed consisting of a goat with a lion's head and a serpent's body; Orthrus, the two-headed hound who begot with his own mother the Sphinx (Greek variety) and the Nemean lion. The last child of Echidne was Cerberus, the three-headed hound of Hell. This creature is probably directly related by Greek imagination (not by family ties) to the dog-headed death goddess, Hecate, and the Egyptian dog-headed Anubis, who conducted souls to the underworld (1).

[1] Nathan Lewis Hatfield Lecture LII, The College of Physicians of Philadelphia, 4 December 1968.

[2] The experimental work discussed in this paper was supported in part by U.S. Public Health Service Research Grant R01 CA 04534 from the National Cancer Institute.

[3] Director, The Wistar Institute, 36th and Spruce Streets, Philadelphia, Pennsylvania 19104.

Drawing by James Wilner

FIG. 1. Echidne.

Through the centuries the symbol of a man with a dog's head remained the representation of abnormality and evil. The folk tales of Serbia and Bosnia tell about "dog-heads" who live in caves, feed on human flesh, and whose touch is ultimately lethal to human beings unless the limb they touch is promptly amputated (2). Serbian dog-heads, Cerberus, Echidne, Hecate and Anubis appear to belong to the same breed.

Occasionally, the specific nature of the man-beast fluctuated with the passage of time. Although the post-classical Siren is represented as a harmless mermaid, the true Sirens were bird-women endowed with the sweetest of voices. They lured unsuspecting sailors to their lair somewhere near Sicily or Capri, put them to sleep, and then tore them to bits, leaving the bones in heaps. Jason, on his return to Greece in the Argo with the Golden Fleece, was exposed to the Sirens' lure as he sailed past their island, but their songs were countered by the still lovelier songs of Orpheus, one of the Argonauts. Sirens were still a menace a generation later, when Odyssens passed their island with his crew (1).

It would be impossible to cite all of the man-beast combinations imagined by the ancients. The Persian and Assyrian bulls and their later relatives, the Cretan Minotaurs, the first products of sexual breeding between a woman and a white bull, possessed again a man's body and a bull's head. According to Mary Renault, a bull-like mask disguised the leprosy-devoured visage of King Minos himself (3).

A hybrid belonging to the bestiary but which does not represent a religious myth is the Griffin, a lion with the wings and mask of an eagle, and which is particularly hostile to horses but not adverse to a nibble of human flesh (4).

The man-beast hybrids are not unique to the Mediterranean civilization. The Manticora, according to *The Bestiary* (5), was born in the Indies (Figure 2). It has the face of a man, with gleaming red eyes, a lion's body, a scorpion's tail, and "it hankers after human flesh most ravenously (5)." In Haiti, there is a voodoo beast named Cigonave which lives today and resembles the Manticora.

Man's imagination has persisted over the centuries in creating man-beasts. Some were

Drawing by James Wilmer.

FIG. 2. Manticora.

even invented in jest, like the mysterious Dodo of Thomas Lovell Beddoes (6):

"I'll not be a fool, like the nightingale
Who sits up all midnight without any ale,
Making a noise with his nose;
Nor a camel, although 'tis a beautiful back;
Nor a duck, notwithstanding the music of quack,
And the webby, mud-patting toes.
I'll be a new bird with the head of an ass,
Two pigs' feet, two men's feet, and two of a hen;
Devil-winged; dragon-bellied; grave-jawed, because grass
Is a beard that's soon shaved, and grows seldom again
Before it is summer; so cow all the rest:
The new Dodo is finished. O! come to my nest."

At times, however, man was reluctant to admit any relationship with animals. The prize-winning limerick (7) of Berton Braley states these objections quite poignantly:

"There was an old fellow named Bryan.
Whose voice was forevermore cryin',
'Do you think that my shape
Was derived from an ape?
Well, I think Charlie Darwin was lyin'.'"

Man-beast hybrids have remained products of man's imagination throughout the 20th Century. In 1953, the French writer, Vercors, devoted a whole book to a product of cross-breeding between man and ape and its socio-ethical impact on the society (8). In a reverse fashion, Franz Kafka in a *Report to the Academy* lets a chimpanzee describe his successful efforts to become a man. He reached his decision to become human when, after his capture in Africa, he found himself on a boat and realized that he had two alternatives: drown while attempting to swim home or become a human. He chose the latter, and felt that he succeeded when he learned how to spit and how to gulp hard liquor without wretching (9).

Turning from this discussion of hybrids of man's imagination to something more factual, interspecies hybrids have been known for a long time, the mule being the classic example of a cross between a horse and an ass. We shall, however, turn from interspecies sexual mating and consider the more fantastic possibility of mating of non-gametic, somatic cells of two remote species.

The cell shown in Figure 3 is an example of the successful fusion of cells of two different species. One parental strain is a human fibroblast cell which originated from human embryonic lung and which had been growing outside the body of the embryo for about 20–25 generations (10). The other parent is a chick embryo fibroblast derived from a fertile hen's egg, after 7–10 days' incubation, and grown outside the egg in tissue culture.

Although the fusion of two different cell types has been known or suspected for a long time (11), the modern era of the

mating of two cell types stems from the work of Barski (12a) and Ephrussi (12b). After mixing in one vessel two cell types originating from two different mouse strains, they observed that the cells mated and gave rise to one cell line which possessed the characteristic of both parental lines.

Successful fusion at that time, however, depended somewhat on chance. The facility with which cells are fused today is due to the discovery of a fusion factor produced by a certain group of viruses which cause formation of multinucleated cells after infection. Fusion factor produced by Sendai virus and still inseparable from the virus particle itself was studied extensively by Okada (13) and used for interspecies mating of somatic cells by Henry Harris of Oxford (14).

Events which take place during fusion by Sendai virus begin with the attachment of the virus particles to the cell membrane and the agglutination of the cells within minutes after exposure to Sendai virus. Agglutination is followed by the slight disengagement of adjacent cell membranes. Within the next few minutes, the openings of the cell membranes become larger, and finally the cell membranes open completely; this leads to the coalescence of the two cells into one (Figure 4). Inactivation does not affect the fusing ability of the virus, and, therefore, inactivated virus is almost always used in fusion experiments.

Using this technique, one can mate cells of various origins. The resulting "progeny" is called a "heterokaryon" if it is a multinucleated cell containing the genotype of the two parental cells. Figure 5 shows a heterokaryon between chick embryo fibroblasts and newborn hamster fibroblasts (10).

When a heterokaryon cell contains nuclei of the parental cells which have similar shape and similar staining properties, the problem of recognition of the origin of the nuclei is solved by labelling one of the parental cell lines with radioactive thymidine for 3 or 4 days prior to fusion and performing autoradiography on heterokaryon cells. Figure 6 illustrates a hamster-human heterokaryon in which the hamster nucleus is labelled and the human is not (15).

Efficiency of fusion depends on cell properties and on cell origin. In general, malignant cells fuse more efficiently with themselves than do normal cells (Table I). There are also specific cells which fuse better than others. For instance, although as a species, mouse cells do not fuse very well with cells of other species, one of the lines used by Barski and Ephrussi produced the best mating cell we have, and most mouse hybrids originated from this culture.

Fusion between cells of different species is also possible. Table II shows the results of fusion between hamster embryo fibroblasts and different animal species. It is perfectly feasible to fuse fish cells with hamster cells—fusion of fish cells with hamster fibroblasts results in 10% of heterokaryons. The chick embryo fibroblast

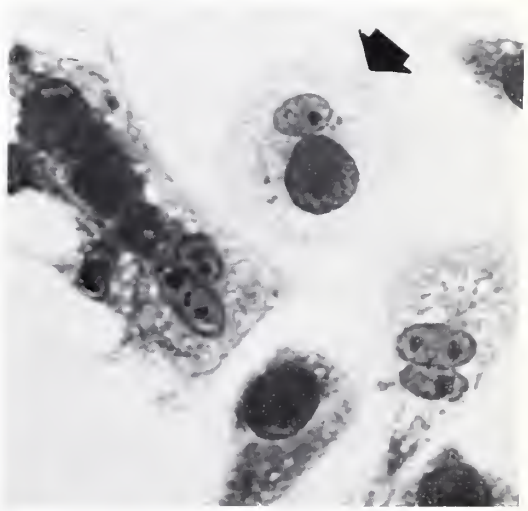


FIG. 3. Heterokaryon between human fibroblast and chick embryo fibroblast (arrow).

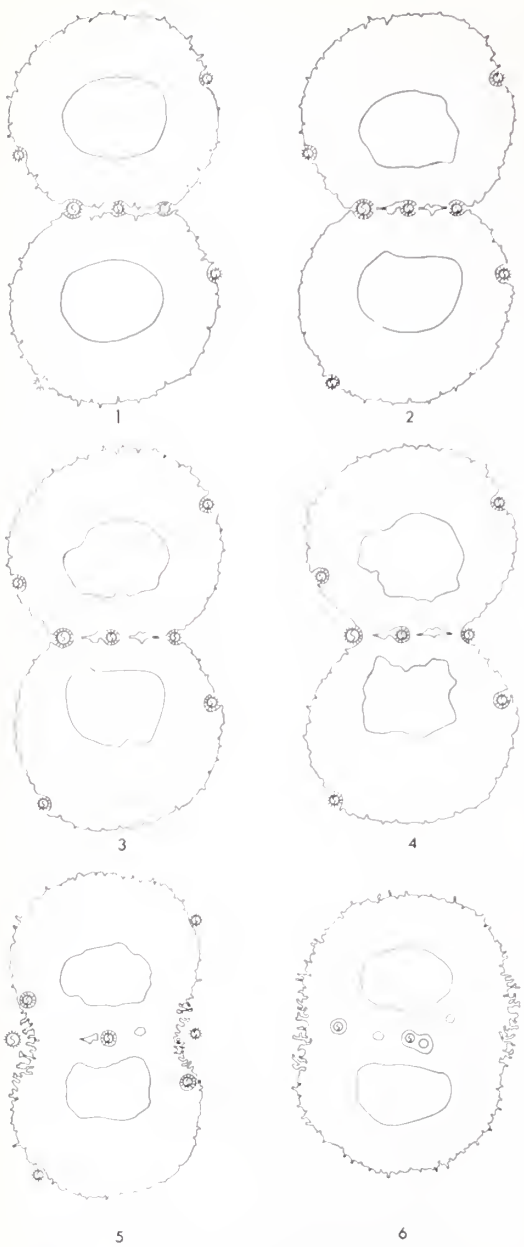


FIG. 4. (1) Agglutination of cells by Sendai virus; (2) Close contact of adjacent cell membranes near adsorbed virus; (3) Degradation of cell membranes and communication of the cytoplasm at points of break; (4) Connection of broken cell membranes; formation of cytoplasmic bridges; (5) Enlargement of cytoplasmic bridges and engulfing of vesicles; (6) Rounding of fused cells; formation of large vesicles. (Figure © by Academic Press; reprinted with permission, from Hosaka, Y. and Koshi, Y. Virology **34**: 432–433, 1968.)

fuses extremely efficiently with cells of other species and is probably one of the best maters.

In addition to autoradiography, there are other markers which can be used to distinguish the parental origin of the nuclei. SV_{40}, a tumor virus, produces in the nucleus of the transformed cells an antigen, an imprint of its presence, which can be recognized by immunofluorescent staining.

If an SV_{40}-transformed cell is fused with a normal cell whose nucleus is labelled with H^3-thymidine, the heterokaryon cells can be first stained for immunofluorescence. The field in which one finds a cell containing two different nuclei is marked, the stain removed and an autoradiograph performed. The same field is found and the result of autoradiography compared with the test for immunofluorescence. The procedure ensures definite identification of the heterokaryons (Figure 7) (16).

The question may be posed: Is fusion possible only between cells which are in the active growth state or is it possible to select as one fusion partner a cell which cannot divide any further, such as a neuron or a red blood cell? The answer is in the affirmative. One can fuse neurons with fibroblasts or with any other growing cells. In fact, the DNA metabolism in nuclei of these dormant cells, such as neurons and red blood cells, becomes activated after fusion, as is demonstrated in incorporation of labelled thymidine (14).

What is the fate of these multi-nucleated heterokaryons? If three or more nuclei are present, the cell either breaks up into mononucleate components or, if it remains intact, it ceases to divide. If, however, the heterokaryon contains two nuclei, it may again break up, or the nuclei may fuse and form what is termed a synkaryon; if this cell divides and if each of the two daughter cells displays genetic properties of both of the parental cells, then we have produced what is termed a hybrid cell. A hybrid cell contains the genes of both of the parent cells

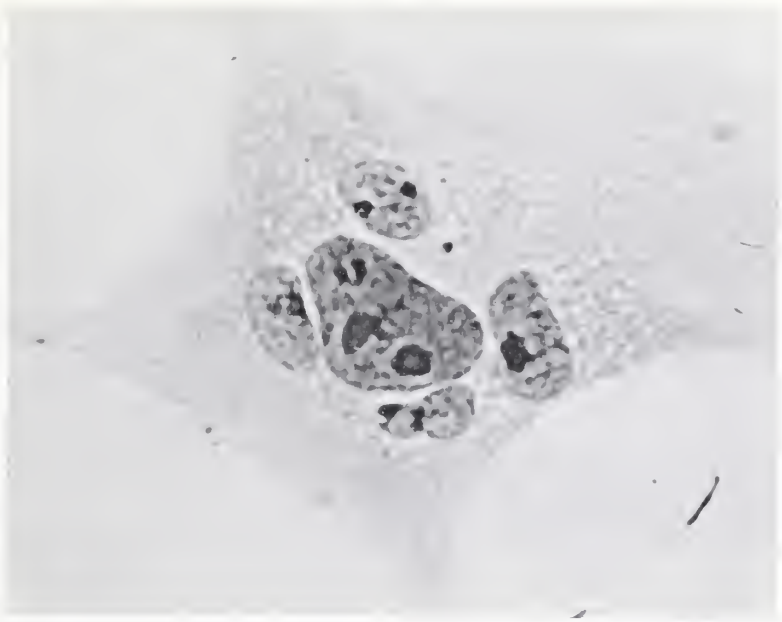


FIG. 5. Heterokaryon between a chick embryo fibroblast and a newborn hamster fibroblast. Large hamster nucleus surrounded by four chick nuclei.

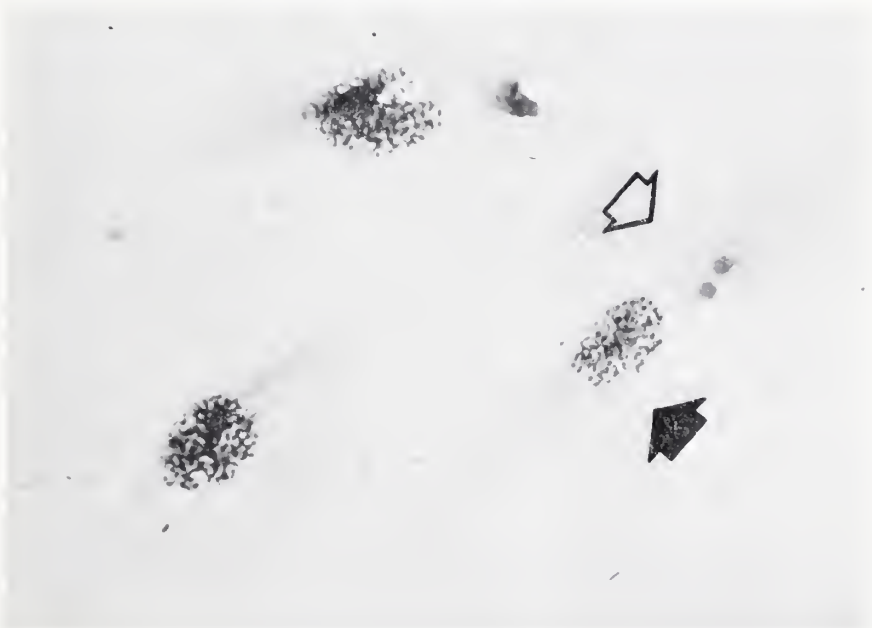


FIG. 6. Heterokaryon between hamster embryo (labelled, —▶) and WI-38 human diploid (unlabelled, —▷).

TABLE I

ABILITY OF NORMAL, MALIGNANT AND TRANSFORMED CELL TYPES TO FUSE WITH THEMSELVES

Species	Character of Fused Cells	Nuclei in Multinucleated Cells (%)
Hamster	Normal embryo (HE) + Sendai	31.4
	Malignant (F-5) + Sendai	80.7
Monkey	Normal Kidney (AGMK) + Sendai	45.0
	SV_{40}-transformed (GMKE-VA) + Sendai	83.4
Human	Normal (WI-38) + Sendai	49.0
	Malignant (KB) + Sendai	86.2
	SV_{40}-transformed (WI-38 Va2R) + Sendai	86.6

TABLE II

RESULTS OF FUSION OF NORMAL HAMSTER EMBRYO FIBROBLASTS (HE) WITH CELLS OF THE SAME AND DIFFERENT SPECIES

Fusion with Cell Type		Percent of Nuclei in:	
Species	Character	Multinucleated cells	Heterokaryons
Fish	Fat-head minnow fibroblast (FHM)	67.5	10.3
Chick	Embryo fibroblasts (CEF)	76.4	54.9
Hamster	Embryo fibroblasts (HE)	31.5	—
	Malignant (F-5)	87.1	61.9
Green Monkey	Monkey kidney cells (AGMK)	53.0	24.2
	Hybrid*-transformed (CVILL "E-46")	46.1	17.6
Human	Normal fibroblasts (WI-38)	50.0	23.4
	Malignant (KB)	82.0	57.2
	SV_{40}-transformed (WI-8 VA2)	72.9	38.6

* ADENO 7-SV_{40} "hybrid"

and can be maintained probably indefinitely in tissue culture (17).

Cell hybrids may be produced by a selective pressure mechanism which will destroy one or both parental cells after fusion in order to allow the hybrids to propagate. If the parent cells are not destroyed, there will be three types of cells present in culture—two parents and the hybrid. If the hybrid does not immediately display an unusual vigor, the parental cells may overgrow it.

These selective pressures can be based on nutritional deficiencies or requirements of the parental cells. For example, there are cells which will grow in the presence of cysteine but which will not grow in the presence of cystathione or glutathione. By removing cysteine from the medium, one of the parental lines may be destroyed (18).

Another example (they are numerous, but I am mentioning only two) is the requirement of a Chinese hamster cell mutant for amino acid proline. In proline-free medium, they will die (19).

There are, however, pitfalls in this technique due to the fact that these requirements are often population-dependent. If the large number of cells needed for fusion—5–10 $\times$ 10^6—is used, the cells may overcome the deficiency and yield false results.

Another selective pressure for production of hybrid cells by destruction of parental cells is drug resistance. Those used most frequently are azaguanine-resistance and bromodeoxyuridine-resistance. Most of the hybrids available today are produced by using at least one of the cell lines which displays this resistance and can be destroyed by special components of the medium (20).

An additional selective pressure is the use of cells originating from metabolic errors. One such cell line stems from Lesch-Nyhan disease. These cells when grown in tissue culture can be destroyed by certain compounds, such as azaserine [6-(1′methyl-4′-nitro-5′-imidazolyl) serine] (21).

If a semi-selective pressure is applied against one type of parental cell, that strain which one is selecting against should be used in excess in the fusion experiment.

Another selective pressure is the use in

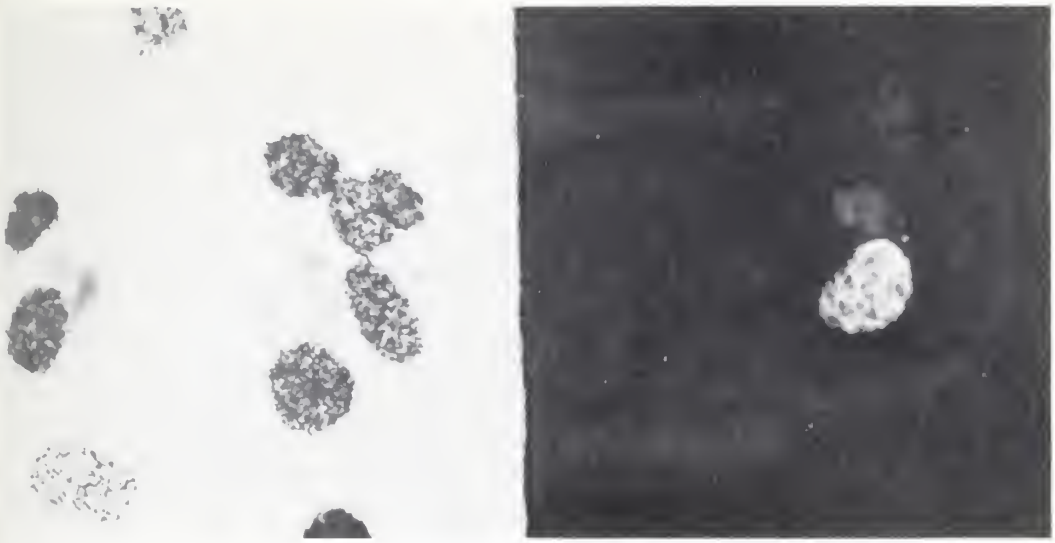


FIG. 7. Heterokaryon between SV_{40}-transformed human and primary African green monkey kidney, showing immunofluorescent staining.

fusion experiments of cells, such as lymphocytes, which grow only in suspension and disappear from the heterokaryon culture, since the hybrid cells grow on glass (22).

How does one recognize hybrid cells? The most frequently applied technique is that of studying the karyotype of the hybrid (23). The hybrid is easily distinguished if there are two distinct karyotypes, such as a Chinese hamster with 22 chromosomal pairs or a rat kangaroo with 11 pairs of chromosomes.

Biochemically, a hybrid is characterized by a special pattern of isozymes, enzymes which exhibit the character of neither of the two parents. These isozymes are enzymes which display a characteristic mobility in the electrophoretic field and the synthesis of which is governed by specific genetic loci. These enzymes cannot be hybridized outside the organism, and, therefore, a hybrid pattern of isozymes is an indication that we are dealing with a cell which originated from two distinct species and which contains the characteristics of both (24).

One can determine the species origin of a hybrid cell, or the two-species origin, by determination of cell surface species antigens of the two parental species. This seems today to present a very sensitive method for recognizing a hybrid cell (14, 25).

Although it is difficult to determine how many hybrids are available today, I shall list those with which I am familiar: man-man hybrid; mouse-mouse; mouse-Syrian hamster; Armenian hamster-Chinese hamster; mouse-rat; and a large number and variety of man-mouse hybrids.

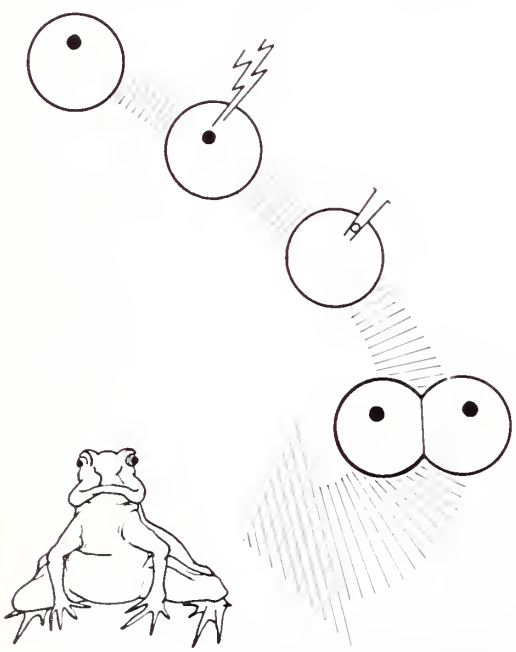
The question has been raised: What will happen if the fusion process is applied to reproductive cells, such as an ovum, rather than to somatic cells? Before discussing this problem, let us turn back several years and examine the possibility of fertilization of eggs without participation of spermatozoa.

Although parthenogenesis of sea urchins, followed soon after by that of frogs, has been known since the turn of the century, it was John Gurdon of Oxford University who, within the last few years, was able to establish experimentally the activation of frog eggs through implantation of nuclei of somatic cells inside the ovum (26).

In a series of brilliantly-conceived experiments, he inactivated the nucleus of an

unfertilized frog's egg by irradiation, while at the same time liquefying the outer jelly coat of the egg. He then implanted into the same egg a nucleus derived from either intestinal or nervous cells of the same or any other frog. Following this nuclear transplantation, the egg became fertilized without any intervention of sperm, started to divide, and gave rise to an adult frog which was an exact copy of the donor of the nucleus. Many of these frogs were fertile and when mated produced the usual number of normal eggs (26) (Figure 8).

Application of the same type of experiment to mammalian eggs is more difficult because the egg has to be denuded of its protective cover, the zona pellucida, in order to be implanted with a nucleus from a spleen cell or from any other body cell. This nucleus transfer can best be accomplished by fusion of, for instance, a spleen cell with the egg. Christopher Graham of Oxford University succeeded in fusing these two cell types experimentally and obtained a cell in which the nucleus of the mouse spleen replaced the nucleus of the unfertilized mouse egg. He was also able to follow a division of the apparently undamaged ovum and observed a two-cell embryo with the spleen nucleus inside the cell (27).



Drawing by James Wilmer.

FIG. 8. Nuclear transplant into frog egg.

It is impossible for these embryos to develop further after implantation into a foster mother. However, recent evidence (28) shows that a one-cell egg with the zona pellucida intact can divide in tissue culture to the blastocyst stage, that it can then be implanted in animals, and that it will result in the birth of a healthy animal. There is no doubt that in the near future an egg, without the zona pellucida, which possesses the nucleus of non-reproductive cells such as spleen or bone marrow may become activated, and after activation reach a stage of development *in vitro* when it can be reimplanted into a mammal and give rise to a mouse (29).

Genetic manipulation of mouse eggs through aggregation rather than through fusion, of the blastocysts obtained from two different mouse strains was successfully undertaken by Beatrice Mintz from the Institute for Cancer Research in Philadelphia. She was able to implant 8–10 embryos of two different genotypes into mice, and to "nurse them" to birth. The offspring were called allophenic because they displayed an orderly, and for them, healthy, arrangement of two cellular phenotypes (30).

With the exception of muscle tissue, there is no evidence that the tissues of the allophenic mice represent true hybrids. There is, however, definite evidence of the existence of a hybrid enzyme in skeletal muscle, and the conclusion was reached that the muscle cell originated from myoblast fusion during embryonic life (31).

Once *in vitro* development of an activated unfertilized egg reaches the stage of successful implantation into an animal, all possible manipulations can be performed. In 1962, in South Africa, two ewes

gave birth to two healthy lambs, each of which originated from eggs fertilized in England which were then transported to South Africa in the oviduct of a rabbit. Upon arrival, they were reimplanted into the uterus of the ewes (32).

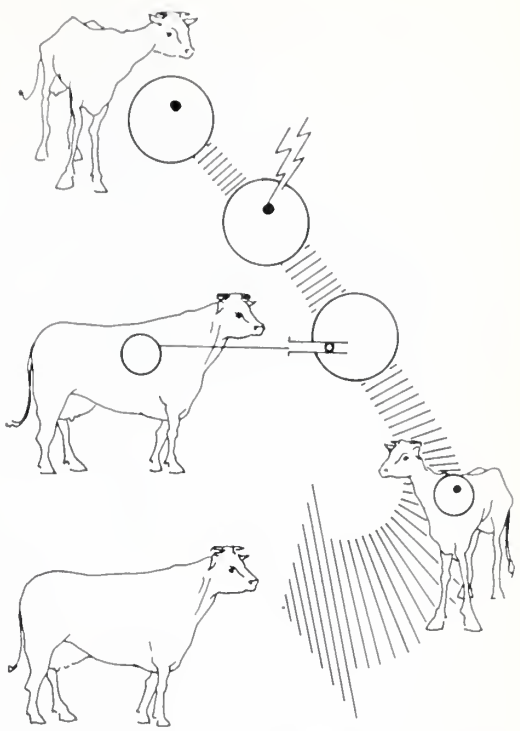
It is now possible also to wash out fertilized eggs from a donor cow and to implant them without any surgical manipulation into the uterus of a recipient cow with a syringe. The embryo will develop into a healthy calf (33).

There is no reason to doubt that once the art of activation of "fertilization without sperm" of eggs is mastered, man will be able to produce at will exact copies of animals that he chooses as donors of the nuclei for implantation into the ovum.

Figure 9 shows what may happen in the future. Eggs flushed from a scrub cow will be activated by a nucleus from a skin cell of a prime beef cow, kept long enough in culture to undergo a few divisions, and then reimplanted into the scrub cow. The ultimate result: an exact copy of the prime beef cow. Whether this will solve the problem of food shortage in the world remains to be seen.

But what will happen if these genetic manipulations are applied by man to man himself? Will he attempt to emulate Dr. Moreau of the famous fantasy of H. G. Wells and mold beasts of two species origin into a human form? Will he be satisfied with having ova still fertilized by the natural means of enjoyment developed into a child outside the body, as in *Brave New World*, or making one-day embryos available for mass distribution?

The following is a quote from the Kaiser Aluminum News, 1966 (34): "Only ten to fifteen years hence it could be possible for a housewife to walk into a new kind of commissary, look down a row of packets not unlike flower seed packages, and pick her baby by label. Each packet would contain a frozen one-day-old embryo and the label would tell the shopper



Drawing by James Wilner.

Fig. 9. A look into the future.

what color of hair and eyes to expect, as well as the probable size and I.Q. of the child. It would also offer assurance of freedom from genetic defects. After making her selection, the lady would take the packet to her doctor and have the embryo implanted in herself, where it would grow for nine months like any baby of her own."

If man were given the formidable tool of genotype copying, would man achieve anything by trying to reproduce human beings which would be exact copies of the fittest and most capable individuals? Apart from the fact that making such products would deprive us of what little physiological fun we can still have, there is no guarantee that we can reproduce only desirable genetic traits without standardizing also some undesirable characteristics which when dispersed among the population at large may be lived with, but which when concentrated in one population alone

Drawing by James Wilner.

FIG. 10. Centaur.

may become impossible to cope with. It was once said (35) that "no one who has known the children of accepted geniuses would suppose that the population would greatly benefit by there being several hundred of them."

Applied wisely to the problems of mankind, genetic copying, if perfected, may ultimately replace artificial insemination and probably not present any more formidable ethical and legal problems.

Application of the process of cell fusion for creation of hybrids will hopefully be confined to the laboratory and not to the creation of monsters. It has to be stressed, however, that even the Greeks considered one hybrid creature as benevolent, helpful and wise. I refer to the centaur (Figure 10), a hybrid between the man and the horse. According to *The Bestiary* (36), "Only the horse can weep for man and feel the emotion of sorrow. And hence in centaurs the nature of men and horses can be mixed."

Swift also extolled the virtue of horses over the human Yahoos, describing friendship and benevolence as the two principal virtues among Houyhnhnms. It is no wonder that it was the kind and patient centaur Chiron to whom Apollo entrusted his son Asclepius to learn the art of healing.

If we enter the twenty-first century under the aegis of the centaur, it may still be possible that we will use the most formidable biological weapons ever available to man with judgment and restraint.

ACKNOWLEDGMENTS

I should like to acknowledge the contributions of Drs. Zenon Steplewski and Barbara Knowles towards the experimental work discussed in this paper and the excellent technical assistance of Miss Tertiu Jelve, Miss Emerita Caputo and Mr. Kohtaro Tada.

I wish to thank Mr. James Wilner for the original art work contained in figures 1, 2, 9 and 10, and Miss Pamela Brown for editorial assistance.

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President's Address: The College of Physicians of Philadelphia*

By FRANCIS C. WOOD, M.D.

During the past year, the President has written letters to the Fellows which have kept them informed of the important events which have transpired in the affairs of the College. Tonight, therefore, instead of reviewing for you all of these events, I have chosen to concentrate on one of them, namely, the fact of our having been designated as the second of the Regional Medical Libraries, related to the National Library of Medicine in Washington, and what is going on in this area. I want to outline the overall plan to give you a picture of the national scene, and of our particular responsibilities, accomplishments, and plans for the future.

Several years ago, Dr. Martin Cummings, head of the National Library of Medicine in Washington, saw the necessity of coordinating the flow of medical information from libraries to the users of this information, and he conceived a plan of establishing about 11 Regional Medical Libraries in America, each of which would receive requests for information from its particular region. Each library would in turn coordinate the activities of the medical libraries in its own region to fill these requests and refer to the National Library only those it could not fill.

Thus far, the following Regional Libraries have been designated:

The National Library of Medicine, Washington.

"Mid-Atlantic Region" (Maryland, West Virginia, Virginia)

1. The Countway Library, Boston (New England)
2. The College of Physicians Library, Philadelphia. "Mid-Eastern Regional Medical Library" (Pennsylvania, Delaware and Southern New Jersey)
3. The Wayne State University Library, Detroit (Michigan, Ohio and Kentucky)
4. The University of Washington Library, Seattle (Pacific Northwest)
5. The John Crerar Library, Chicago (Illinois, Wisconsin, Indiana, Iowa and Minnesota)

Five others are being considered:

1. New York (New York Academy of Medicine Library)?
2. Southeast (Emory)?
3. California (U.C.L.A.)?
4. Mississippi Valley
5. Mississippi Valley

Our ability to assume this responsibility for the Mid-Eastern region was based not only on the excellence of our library and its staff, but also on the foresight of Dr. John Gibbon, who appointed in 1964 a Regional Medical Library Committee under the chairmanship of Dr. John Huber, which was made up of librarians and library scientists in this area. This group formed the basis for our Medical Library coordination in this region quite far in advance of the developments of the past year. This Committee has been recently enlarged to include librarians from other selected medical institutions in our region. I have attended a number of its meetings. This Committee is made up of a group of intelligent, competent, well-spoken, widely representative friends, ably guided by John Huber and Elliott Morse, making sound plans for carrying out our common responsibility.

Yet even though I knew this, I was

* Annual Report of the President, The College of Physicians of Philadelphia, 8 January 1969.

astonished at the phenomenal effectiveness with which we functioned right from the beginning. Here are the facts for June, July and August 1968 (our first three months). We received 5000 requests. We were able to fill 90% of them from our own library. Seven per cent were filled from the other libraries in the region. Two per cent were rejected because they were improperly submitted. Only one per cent had to be referred to the National Library, as compared to 8% in the past.

Of these requests, 77% were filled in 24 hours, 20% more in three days. The last 3% were filled within 6 days—a remarkable and probably unprecedented record!

The library of any non-profit educational institution in this region which cannot fill a request may forward it to us. The main change we have experienced in our operations thus far is a doubling of our photoduplication. We now supply about 2000 articles per month to these libraries. Of course, our other library functions have continued unchanged.

We have set up a well-coordinated evaluation program for self analysis, to determine how well we are carrying out our job as a Regional Medical Library. We are re-doing the work room in the library. It will be more attractive and more functionally efficient.

We have reorganized and rebuilt our telephone communications.

We are sending a trainee to the National Library of Medicine this month, so that we will be able to set up a MEDLARS search program.

Next, we must establish a regional communications organization under a regional director whom we have not as yet been able to find. If you know such a person, especially one with university administrative experience, let Elliott Morse hear from you promptly. The purpose of this organization would be to teach all those able to be benefited by this service what facilities are available and how to use them to the best advantage. We must reach out to all the medical libraries in this region and educate even the smallest as to how to use the new facilities.

We are exploring the establishment of an audiovisual communications center.

We have an outside Visiting Committee under Dr. George P. Berry, which will visit us on January 13th to give us the benefit of its evaluation of our present facilities and activities and its views on future plans. It is made up of seven outstanding individuals in library science from all over this country.

Well, that is the story thus far. We can all be very proud of the job that is being done by Elliott Morse and his staff and by John Huber and his Regional Medical Library Committee.

Report of the Secretary for the Year Ended December 31, 1968

(Attendance)

Stated Scientific Meetings

January	The Third Theodore F. Bach Memorial Lecture Robert C. Mellors, M.D., Ph.D.	127
March	The Mary Scott Newbold Symposium (*Mary Scott Newbold Lecture LXXXVIII*). A Community Health Forum on "Drug Abuse: Legal and Ethical Implications of the Non-Medicinal Use of Hallucinogenic and Narcotic Drugs." Moderator: J. Russell Elkinton, M.D. Panel: Henry Brill, M.D. Dana L. Farnsworth, M.D. Jonas Robitscher, M.D.	172
April	Joint Meeting with the Philadelphia County Medical Society at the Philadelphia County Medical Society. Presentation of Certificates to Physicians who have completed fifty years in the practice of medicine. Certificates awarded by John R. Harris, M.D., President, Pennsylvania Medical Society. Presentation of the Strittmatter Award to Jonathan E. Rhoads, M.D., by John B. Montgomery, M.D., Chairman, Strittmatter Award Committee.	
May	The Seventh Hira S. Chouké Lecture Elliott F. Osserman, M.D.	169
October	The Twenty-seventh Alvarenga Lecture Jean Mayer, M.D.	144
November	The Mary Scott Newbold Symposium (*Mary Scott Newbold Lecture LXXXIX*). A Community Health Forum on "Survival? Man and Water." Moderator: Earl Finbar Murphy, Esq. Panel: Samuel S. Baxter, Commissioner, Phila. Dept. Water Ruth Patrick, Ph.D. M. Gordon Wolman, Ph.D.	132
December	The Fifty-second Nathan Lewis Hatfield Lecture Hilary Koprowski, M.D.	78

(Total Ballot)

Regular Business Meetings:

January 3, 1968	347
May 1, 1968	315
October 9, 1968	No balloting
December 4, 1968	345

Sections of the College (*Membership*)

Ophthalmology	82
Otolaryngology	40 & 3 Honorary & 3 Dues Remitted
Public Health, Preventive & Industrial Medicine	46
Medical History (Fellows & Friends of the Section)	118

Membership:

	Fellow	Non-Res.	Assoc.	Honorary Foreign	Honorary U.S.	Hon. Assoc.	Total
December 31, 1967	1,114	155	0	2	5	4	1,280
Died during year	29	2		1			32
Resigned	4						4
Elected	71	1					72
Transferred from Resident to Non-Res.		9					
Transferred from Non-Res. to Resident	0						
Failed to Qualify	0						
Forfeited	6						
December 31, 1968	1,146	163	0	1	5	4	1,319
Life Membership							
New Type	15	4					
Under 70	26	7					
Over 70							
Old Type (Commutation dues)	6	0					
	47	11					
Dues Remitted							
Before 1968	43	13					
During 1968	6	0					
	49	13					
Annual Contributors as of December 31, 1968	1,050	139					

GEORGE A. HAHN, M.D.
Secretary

Report of the Treasurer for the Year Ended June 30, 1968

Assets

General Fund:		
Cash in bank and on hand	$ 40,932.17	
Short term certificates of deposit	75,000.00	
Short term commercial paper	60,000.00	
		$ 175,932.17
Restricted Trust Funds:		
Cash in bank	14,565.78	
Short term certificates of deposit	25,000.00	
		39,565.78
Maintenance and Reserve Fund:		
Cash in bank	1,175.40	
Investments	17,983.50	
		19,158.90
Joseph N. Pew, Jr., Memorial Loan Fund:		
Investments	53,216.57	
Notes Receivable	29,050.00	
		82,266.57
Employee's Pension Plan:		
Investment with Insurance Company of North America		47,132.28
Trust Funds:		
Uninvested principal cash	18,156.54	
Uninvested income cash (restricted)	39,565.78	
Mortgage	23,625.00	
Real Estate	158,905.33	
Bonds	581,317.54	
Preferred stocks	67,421.29	
Common stocks	1,508,039.65	
		$2,397,031.13
Plant Fund:		
Land—16–25 South 22nd Street	95,000.00	
Building	1,420,747.93	
Furniture and fixtures	1.00	
Deposits on perpetual fire insurance policies	11,462.28	
		$1,527,211.21
		$4,288,298.04

Funds

General Fund:	
Library:	
General account	($ 4,266.30)
Medical documentation service	4,266.30

Book funds	1,207.55		
Government grant funds	13,074.27		
		$	14,281.82
Greater Philadelphia Committee for Medical Pharmaceutical Science			5,363.89
Development Funds			132,572.63
Unexpended operating fund balances:			
Current operations	22,104.44		
Friends of the Library	1,265.00		
Section on Public Health, etc.	73.00		
Section on General Medicine	271.39		
Total operating funds—exhibit B			23,713.83
			175,932.17
Restricted Trust Funds—unexpended income			39,565.78
Maintenance and Reserve Fund—principal			19,158.90
Joseph N. Pew, Jr., Memorial Loan Fund—principal			82,266.57
Employees' Pension Plan—principal			47,132.28

Trust Funds:

Principal net worth:			
Discretionary common trust fund	$2,136,533.82		
Legal common trust fund	23,572.94		
Trust funds not pooled	14,828.26		
Fund for purchase of units in discretionary common trust fund	23,625.00		
Real estate fund	158,905.33	2,357,465.35	
Income net worth:			
Discretionary common trust fund	33,965.42		
Legal common trust fund	979.17		
Trust fund not pooled	4,621.19	39,565.78	2,397,031.13
Plant Fund—principal			1,527,211.21
			$4,288,298.04

NOTES: The various fund investments are shown at their recorded values, which values substantially represent cost.

GENERAL FUND

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS

Year Ended June 30, 1968

Receipts:

Income on investments, net of agents fees:			
Trust funds	$113,977.60		
Less: Amount transferred to income of the several restricted trust funds	15,006.86	$ 98,970.74	
Erlanger Garage			
Income	9,510.00		
Expenses	5,186.05	4,323.95	
Income from funds, principal of which is not administered by College	2,940.94		
Less, amount transferred to income of a restricted fund	496.37	2,444.57	
Interest on mortgage	1,126.59		
Income from other sources	2,874.50	4,001.09	$109,740.35
Contributions:			
Fellows dues		90,078.00	
Use of hall and projector		3,907.75	

Development Funds		135,500.44	
For Greater Philadelphia Committee for Medical—Pharmaceutical Science		21,500.00	250,986.19
Transfers from other funds:			
Transfer to current operating from Miscellaneous Contributions Fund		1,463.00	
For covering deficit of Entertainment Committee: S. Weir Mitchell Entertainment Fund		290.27	1,753.27
Library:			
Contribution plan	25,937.00		
Photostats, fines, etc	61,860.45	87,797.45	
Medical documentation service		64,459.06	
Special account—influenza grant		2,811.00	
Special account—resources grant		35,154.00	190,221.51
Miscellaneous			
Sundry dinner subscriptions		9,398.52	
Other		890.50	10,289.02
Total receipts			$562,990.34
Disbursements:			
Operating expenses:			
Hall Committee		$ 43,070.61	
Office of the Secretary-Treasurer		29,727.98	
Old Age Benefit taxes		8,028.51	
Counsel fee		1,000.00	
Publication Committee		8,402.54	
Entertainment Committee		1,882.72	
College Collections Committee		6,691.61	
Premium to Pension Fund		4,492.00	
President's room		525.00	
Blue Cross		566.10	
Library General:			
Salaries	$136,337.48		
Books, journals, supplies, etc	66,316.17		
Book Fund	4,106.16	206,759.81	
Medical documentation:			
Salaries	50,115.18		
Other expenses	10,077.58	60,192.76	
Library Special accounts:			
Journal acquisition fund	2,767.65		
Influenza grant	19,019.36		
Resources grant	45,840.46	67,627.47	
Greater Philadelphia Committee for Medical-Pharmaceutical Science		23,893.25	
Development Fund		17,174.22	
Sundry dinner expenses		9,876.60	
			$489,911.18
Excess of receipts over disbursements			73,079.16
Cash balance, June 30, 1967			102,853.01
Balance, June 30, 1968:			
Cash in bank and on hand	40,932.17		
Short term certificates of deposit	75,000.00		
Short term commercial paper	60,000.00		
			$175,932.17

STATEMENT OF COST OF INVESTMENT UNITS PURCHASED IN THE VARIOUS TRUST FUNDS BY THE RESTRICTED ENDOWMENT FUNDS

July 2, 1967 to July 1, 1968

Discretionary Common Trust Fund

Balance, July 2, 1967		$ 821,073.55
Receipts:		
S. Weir Mitchell Associates journal fund	$ 8,170.19	
Arthur P. Hitchens Fund	1,000.00	
Life Membership Fund	63.64	
Transfers from unit adjustment account:		
Arthur P. Hitchens Fund	22.13	
	9,255.96	
Less, amount insufficient to purchase one unit, credited to unit adjustment account	28.25	
		9,227.71
Balance, July 1, 1968		830,301.26

Legal Common Trust Fund

Balance, July 1, 1967 (no change duri ng year)	23,500.0

Trust Funds not Pooled

Balance, July 1, 1967 (no change during year)	14,974.526
Total restricted endowment funds, July 1, 1968	$ 888,775.80

STATEMENT OF COST OF INVESTMENT UNITS PURCHASED IN THE DISCRETIONARY COMMON TRUST FUND BY THE GENERAL ENDOWMENT FUND

July 2, 1967 to July 1, 1968

Balance, July 2, 1967		$ 401,822.66
Receipts:		
Entrance contributions	$ 2,650.00	
Voluntary contributions from Fellows, etc.	2,164.00	
Book or Remembrance	225.50	
Amortization of mortgage—13th and Locust Streets	2,250.00	
Estate of George W. Norris	500,462.50	
	507,752.00	
Less: Amount insufficient to purchase one unit, credited to unit adjustment account	19.93	507,732.07
Balance, July 1, 1968		$ 909,554.73

STATEMENT OF COST OF INVESTMENT UNITS PURCHASED IN THE DISCRETIONARY COMMON TRUST FUND BY THE COLLEGE EXTENSION FUND

July 2, 1967 to July 1, 1968

Balance, July 2, 1967		$ 5,353.61
Receipts:		
Voluntary contributions from Fellows	$ 233.00	
Income earned on invested principal	300.74	
	533.74	

Less: Amount insufficient to purchase one unit, credited to unit adjustment account	2.62	
		531.12
Balance: July 1, 1968		$ 5,884.73
Total of all restricted funds, July 1, 1968		$1,784,215.28

KENDALL A. ELSOM, M.D.
Treasurer

Annual Report of the Committee on the Library*

Indulgence in superlatives risks evoking the amusement of posterity but it accurately reflects the mood of the chronicler of this year. By the present reporter's standards it is difficult to imagine a more significant year than the one in which The College of Physicians Library was funded by the National Library of Medicine to serve as the Mid-Eastern Regional Medical Library. The fact that the Library has actually been fulfilling a regional mission for many years does not diminish the satisfaction of this recognition nor the trepidation over the realization that this mission can now be expanded into full partnership in a viable network of libraries dedicated to better service to biomedical personnel in Pennsylvania, Delaware, and southern New Jersey. This partnership, in turn, experiences the excitement of membership in a chain of regional medical libraries ambitious to achieve the objectives of the Medical Library Assistance Act of 1965, to improve health professional education, investigation and practice, by improving the means of acquiring, storing and disseminating health information.

Mid-Eastern Regional Medical Library Program. The path which led to the establishment of the Regional Medical Library Service Program has been recounted too often in previous annual reports to permit more than a listing of the key events here: 1., Submission of a memorandum to the Philadelphia medical school deans by the librarians of the Philadelphia medical schools and The College of Physicians on local medical library needs in November 1962; 2., Endorsement of the "Philadelphia Plan" by local medical school librarians for presentation at a conference of "regional minded" medical librarians at Harvard University in February 1963; 3., Request by the Philadelphia Medical School Deans' Committee in October 1963 for the appointment of an interlibrary medical oragnization by the President of The College of Physicians of Philadelphia; 4., Establishment of the Philadelphia Regional Medical Library Committee in January 1964, at which time the Committee declared "a responsibility to keep itself informed of national developments affecting regional libraries and to initiate or recommend activity which will coordinate Philadelphia service within any national framework;" 5., Attendance by Martin M. Cummings, M.D. and Carl D. Douglass, Ph. D., from the National Library of Medicine in June 1965 at a meeting of the Philadelphia Regional Medical Library Committee joined by the deans and other Philadelphia medical leaders; 6., Endorsement in the spring of 1966 of a Cooperative Agreement between the College Library and Philadelphia area medical libraries by 53 institutions; 7., Participation by over 150 persons in the Philadelphia Regional Medical Library Conference in January 1967, together with representatives from the National Library of Medicine; 8., Submission of a grant application in August 1967 by the College to establish and operate a Regional Medical Library; 9., Visit by a site inspection team from the National Library of Medicine reviewing the application; 10., Funding of the Regional Medical Library Program effective June 1, 1968.

In the Beginning. A running start was insured because existing services funded with Resource Grant money were absorbed by the Regional Medical Library Program. Photocopy and Teletype Services financed by Resource Grant funds since April 1967 were expanded by Regional Grant funding. This service, previously offered only to medical school and hospital libraries, was now opened to all non-profit

* January 1–December 31, 1968.

biomedical libraries and to qualified "non-affiliated" individuals in the region.

A limited telephone reference service, first offered with Resource Grant funding in February 1968, was extended to a larger audience.

Regional Photocopy and TWX Section. Summary statistics of articles photocopied in lieu of interlibrary loan since April 1967 by Resource Grant and Regional Grant programs follow:

April–December	1967	(Resource)	7,155
January–June	1968	(Resource)	8,975
July–December	1968	(Regional)	10,306

A more precise analysis of the disposition of requests received during 1968 is offered herewith:

1968	Requests received	College filled	Referred elsewhere	Rejected	Returned unfilled	Not recorded
Jan.–June	10,439	8,975	826		617	21
July–Dec.	12,120	10,306	1,094	461	258	1

The following statistics for the period July to December 1968, are selected from an equivalent of ten pages of data prepared to meet National Library of Medicine reporting requirements:

Requests received	12,120	
Requests rejected	461	3.8%*
Filled by College	10,306	88.4%
Referred elsewhere		
a. within region	915	7.9%
b. to other regions	6	.1%
c. to N.L.M.	173	1.5%
Not recorded	1	.1%
Returned unfilled	258	2.2%

* Percentage of requests received; other percentages are portions of requests accepted.

The times required to fill these requests were:

Filled on day of receipt	462	4.5%
Filled within one working day	6,634	64.4%
Filled within two working days	3,103	30.1%
Filled within three working days	106	1.0%
Filled within 6–10 working days	1	.1%

From the total of requests received during this six month period, 11,464 came from Pennsylvania, 498 from New Jersey, and 124 from Delaware. The most active users were: Presbyterian-University of Pennsylvania Medical Center, 938 (7.7%); Graduate Hospital of the University of Pennsylvania, 793 (6.6%); Children's Hospital of Philadelphia, 681 (5.6); University of Pennsylvania School of Medicine, 621 (5.1%); Norristown State Hospital, 334 (2.8%).

Regional Reference Services. Resource Grant funding was used in February 1968 to provide limited telephone reference service which was initially intended: a., to verify citations and to locate documents not in the College Library; b., to supply simple facts ascertainable from a single reference or text book; c., to consult several sources to provide simple summaries of readily available information; d., to assemble pertinent journal articles and books to permit an investigator to review current developments; e., to conduct literature searches requiring not more than one hour's search time; and f., to conduct longer searches if available staff time permitted.

With the advent of Regional Grant funding in mid-year, reference services were expanded and were offered to a wider audience. In reporting on regional reference services during the first quarter, Mrs. Joyce Mingledorff, Head of the Section, told the Mid-Eastern Regional Medical Library Committee that requests for verification of citations are one of the most popular services. Forty-three percent of the requests were for this type of assistance. This percentage does not include verifi-

cation of interlibrary loan and photocopy requests. A surprising number of requests for book selection assistance suggests a possible need for this sort of guidance. Sixty-nine percent of reference requests have come from hospital libraries.

Reference work is not limited to material within the Library. Phone calls were made to libraries in the city and letters were written to libraries in the region seeking assistance when they own a volume we want checked. Recently a medical librarian in Yugoslavia supplied needed information. Since then, the Library reciprocated by filling a request for her. Assistance is given to the Photocopy Section and to the Interlibrary Loan Department in location of material not in the College Library.

Miss Christine Kislo joined the Regional Reference Section in October, providing a staff of two. As reference service grows, more staff will be added.

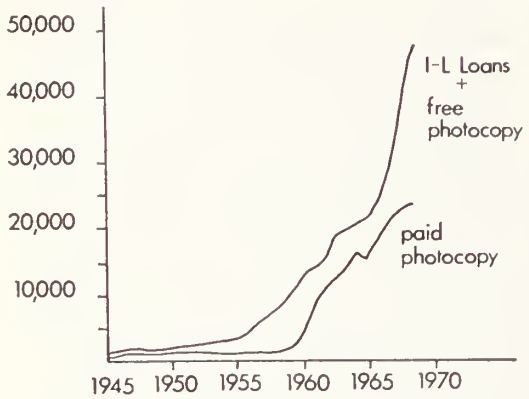
MEDLARS Search Formulation. The services of a MEDLARS Search Formulator were engaged at the end of the year. Miss Lee J. Tanen will be employed in the College Library for a month before beginning a four to six weeks training period at the National Library of Medicine. She will then return to the College to receive MEDLARS and other search requests from the region for assessment of their suitability for computer searching. Search requests selected for automated processing will be formulated for input into the MEDLARS system in Bethesda without further processing by the National Library of Medicine staff. We anticipate that in the beginning, at least, the MEDLARS Search Formulator will have time to conduct manual searches and assist in general reference work in addition to her more specialized duties.

Evaluation and Control Data Management. The original medical library grant application envisioned a regional planning function associated with the Regional Planning Council, provided with a separate secretariat. The responsibility for the continuing evaluation of the regional library's performance and the collection of data for this purpose was originally vested in another department. As the program was developed it became apparent that both the planning effort and the monitoring function were dependent on the same data. The logic of combining these operations became even more obvious when Miss Carol C. Spencer was recruited by the Regional Library program. Her previous association with the Institute for Advancement of Medical Communication qualified her to undertake planning studies as well as to collect data for continuing surveillance of the program itself. Particularly fortuitious is the willingness of Richard H. Orr, M. D., Director of the Institute, to serve as an advisor in this area. Dr. Orr wrote the section on Evaluation in the original grant application. The Institute has pioneered in developing self-evaluation techniques for medical libraries.

Regional Interlibrary Loan Pattern Study. This basic planning study was initiated by the Institute for Advancement of Medical Communication before the Regional Medical Library program was funded. It was completed by Miss Spencer after her transplantation to the College. The study reveals pre-Regional Grant traffic patterns and it should provide a base line to measure the effect of the regional program itself. It also tells us something about the growth of demand for interlibrary lending including the provision of photocopy in lieu of loan of the original.

A statistical study was made of the interlibrary loans and photocopies supplied by The College of Physicians Library from 1945 to 1968. These figures provide a sta-

tistical background for the traffic pattern study as presented graphically below.



Significant dates reflected in the chart above are the introduction of Xerography to the College Library in June 1960 and the initiation of free photocopy in lieu of interlibrary loan to non-profit educational libraries in April 1967.

The interlibrary loan traffic pattern study was designed to reveal the volume and distribution of loans in the region. Information was sought to identify who does most of the lending and borrowing, how much they do, the extent of regional demands on the College and on the National Library of Medicine, and whether this can be expected to continue.

Questionnaires were sent to 111 libraries which borrow from the College of Physicians. The data derived from the 75 libraries who responded with usable data identified 195 different libraries from which they had borrowed during the past year. The total number of loans and photocopies thus reported was 57,330.

The borrowers reported that they received 96% of the material they sought, 47% as originals and 53% as photocopies and that 89% of their borrowings were serials.

The 75 borrowing libraries may be categorized as follows:

Type of Library	Requests Filled	% of Requests Filled
Academic		
14 Health sciences	9,145	17%
5 Other	373	
Non Academic—Res. & Dev.		
9 Commercial	15,599	55%
4 Information—Publishing	14,531	
2 Government laboratories	406	
4 Other research & devel.	887	
Hospitals		
4 Veterans' Administration	1,747	26%
26 Teaching	12,414	
3 Other	1,011	
Health Service Agencies		
2 Government	1,127	2%
1 Private	10	
Medical Society		
1 Medical Society	80	1%

The characteristics or identities of the lending libraries arranged in the order of their share of the volumes loaned and photocopies provided follows:

The College of Physicians	66%
Academic libraries	17%
Other libraries	6%
Libraries outside the region	6%
National Library of Medicine	5%

In considering these figures it should be remembered that they pertain only to the 75 responding libraries and not to the region as a whole.

This study identifies the following groups of borrowers from the Library of the College in the order of their activity: pharmaceutical companies, information agencies, teaching hospitals, and medical schools. More detailed analysis of the data collected may be obtained from the full report, "Pre-Regional Interlibrary Loan Patterns," by Miss Carol C. Spencer. Requests for copies of this unpublished report may be directed to the Regional Medical Library Program at the College Library.

Regional Serials List. A beginning has been made on a computerized list of serials.

Initially it will be a list of currently received titles for the College Library. The Datatext system of preparation permits the addition of new elements to this list. Indication of subject, periodicity, geographic origin, name of agent or other source may be added for publication or for internal control. The College Library's holdings of each title may be added as may holdings data for non-current titles. At a later date it will be possible to interpolate receipt and holdings information from other libraries. Access to this information would be from lists printed out or through computer terminals in other libraries. The computer store is a commerical centralized facility used by the College Library on a time rental basis.

The Medical Documentation Service has gained experience in use of this equipment in production of three abstracting journals. Miss Alberta Berton, the Director, and other M.D.S. staff members generously assisted Mrs. Beatrice Davis, Assistant to the Librarian, in these early periods of planning and experimentation. Expert guidance is given by Mr. William Stoebe of the IBM Service Center. Consultations with Mr. Jack Slater, Assistant Director of Libraries at Drexel Institute of Technology, should insure compatibility with a list of science journals being developed at Drexel and the University of Pennsylvania.

Regional time table. Pleasant as it is to report the accomplishments noted above, it is proper to balance this with admission of the program's shortcomings. A supplement to the original grant application established a time table for the implementation of regional library services. This time table has suffered badly from the Library Administration's inability to select a candidate for the Directorship of the regional program. In honoring the theory that the program should be staffed by its Director, the College Library Administration has only staffed those parts of the program which seemed absolutely necessary.

Service areas as yet undeveloped include: orientation and training of personnel from major user facilities; a Regional Communication Agent to assess the information needs and newly developed resources within the region and to publicize regional medical library services; continuing education of individuals who use the regional library directly or indirectly through other libraries; a messenger service, and audio-visual services.

The appointment of the Head (or Director) of the Regional Services Program, originally considered as a "First Month" priority, remained unaccomplished at the end of the last month of the current library report year (the seventh month of the first grant year). The MEDLARS Search Formulator was appointed in the seventh month to begin in the eighth month and to begin the National Library of Medicine trainee period in the ninth month, instead of in the first month as was originally declared to be our objective. Other time table objectives were missed by lesser intervals of time.

Visiting (Survey) Committee. At the end of this report year, a Visiting Committee had been appointed by the President of the College and two days in January had been agreed upon for the first phase of their survey. The arrival of this Committee in the eighth month of the regional grant year instead of in the first month, as the time table predicted, is due to an unrealistic schedule, and to the tragic death of Mr. Ralph Esterquest, who had agreed to play a major role in the survey. Under the Chairmanship of George P. Berry, M.D., Dean Emeritus of the Harvard University School of Medicine, the Visiting Committee consists of Mr. Harold Bloomquist, David Kronick, Ph.D., Mr. Jess Martin, Mr. Erich Meyerhoff, Richard H. Orr, M.D., and Edmund Pelligrino, M.D.

Regional Medical Library progress? At

the end of the first six months of operation as the Mid-Eastern Regional Medical Library, nine members of the staff had been appointed. There was much to provide a sense of accomplishment but the absence of a Head was cause for concern, and the discrepancy between optimistically conceived objectives and realistically attained goals was large enough to dispel any complacency.

Mid-Eastern Regional Medical Library Committee. It is appropriate to close this section of this annual report with a list of the current members of this Committee who have never failed to respond to appeals for their advice and support. The name of this Committee has been changed from The Philadelphia Regional Medical Library Committee to better reflect its representation.

John Franklin Huber, M.D., Chairman, Temple University School of Medicine
Jacqueline Bastille, Smith, Kline & French Laboratories
Catherine Brosky, Graduate School of Public Health, University of Pittsburgh, representing Regional Medical Program of Western Pennsylvania
Fred D. Bryant, Hershey Medical Center, representing Susquehanna Valley Regional Medical Program
Lucy F. Cooke, Hahnemann Medical College
Ruth Y. Diamond, Temple University School of Medicine
Ida J. Draeger, Woman's Medical College of Pennsylvania
Marion Fay, Ph.D., representing the Philadephia Medical School Deans' Committee.
Helen Lake, Philadelphia General Hospital
Robert T. Lentz, Jefferson Medical College
Jess A. Martin, Temple University School of Medicine
Elliott H. Morse, The College of Physicians of Philadelphia
Samuel X Radbill, M.D., The College of Physicians of Philadelphia
Jerome S. Rauch, University of Pennsylvania School of Medicine
Carroll Reynolds, Ph.D., University of Pittsburgh School of Medicine
Dean W. Roberts, M.D., Hahnemann Medical College, representing the Greater Delaware Valley Regional Medical Program.
Richard L. Snyder, Drexel Institute of Technology
Eugene C. Syrovatka, LL.D., Delaware Academy of Medicine
John K. Clark, M.D., Chief RMP Activities, University of Pennsylvania School of Medicine
Sherman Garrison, M.D., Medical Society of New Jersey
W. Wallace Dyer, M.D., *Ex officio,* The College of Physicians of Philadelphia
Francis C. Wood, M.D., *Ex officio,* The College of Physicians of Philadelphia

There were two meetings of the Mid-Eastern Regional Medical Library Committee during the year. A meeting was held in May conjointly with the Special Libraries Council of Philadelphia and Vicinity and the Philadelphia Regional Group of the Medical Library Association. Speakers were Mr. T. Mark Hodges, Francis A. Countway Library; Dean W. Roberts, M.D., R.M.P. Activities, Hahnemann Medical College; Mr. Elliott H. Morse and Mrs. Beatrice Davis of The College of Physicians. Reports of the first quarter's activities of the Regional Program were given in November when the Committee was joined by the Regional Planning Council.

Resource Grant Program. The Resource Grant Program budget for calendar year 1968 (its 02 year) was originally conceived on the supposition of Regional Grant funding by February 1968. Federal budget difficulties which delayed regional funding until June required Resource Grant support of Photocopy and TWX Services for

six months instead of one month and thereby blighted much of the original Resource Grant plans. Most important, the Resource Grant subsidized the position of Assistant to the Librarian, thus making the survival of the Librarian possible. Minimal support was provided for Acquisitions Department personnel and for the purchase of some informational materials.

Workroom renovation. A particularly urgent need which was met with Resource Grant funds was the rearrangement, refurnishing and refinishing of the Library workroom. This renovation will provide desk space for some members of the Regional Medical Library staff and for two photoduplication machines from that program, alleviating a serious overcrowding problem in that section. Space was gained by the replacement of oversized desks and the displacement of little-used catalogs. Plans include building of shelving and storage cabinets in various wall areas and provision of office space for the Assistant to the Librarian. Fresh paint, the imaginative use of color, the concealment of ugly factory type windows with bold curtains, and the rearrangement of work areas to expedite the flow of materials, all testify to the wisdom and meticulous planning of Mrs. Beatrice Davis and Le Fort & Strite Associates Inc. which served as consultant. A special tribute of appreciation is due the pages, catalogers and others who demonstrated their adaptability during the months of upheaval.

Resource Grant-funded Photocopy and TWX Services and the Limited Telephone Reference Service are described above in the section on the regionally funded services which superseded them.

The College Library Picture—1968

The College Library. The designation of the College Library as the Mid-Eastern Regional Medical Library would have been inconceivable were it not for the fortress-like strength of its collections and the reputation for community service which have been guaranteed by many generations of dedicated librarians with the strong moral and financial support of concerned Fellows of the College. It may seem ironic, therefore, that such a large proportion of this year's annual report is devoted to regional developments. This is especially true because the success of the regional effort will always be dependent upon the continued strength of the collections and staff of the College Library. The "service" arm can be no stronger than the "library" body without which service would be impossible. This truth is especially poignant when there are fundamental unsolved problems which jeopardize the College Library's ability to maintain the standards of the past. Such basic needs as space for staff and books, adequate staff to maintain minimal levels of housekeeping efficiency, intelligent acquisition and prompt processing of new materials, and competitive salary scales to maintain staff moral are not being met.

Space for books. The last two annual reports and a considerable amount of study by officers of the College and staff of the Library have been devoted to the problem of housing an ever-growing collection. The Library now faces the necessity of clearing bound volumes of duplicate journals and miscellaneous gifts out of the first floor of the new stack to permit a shifting of five floors of stack to gain a few years *Lebensraum.* Hopefully, the Visiting Committee, noted earlier in this report, may assign priorities to such alternatives as putting two more floors on the new stack, extending the stack eastward to the Van Pelt Street building line, or seeking space in the Erlanger Garage or in a new building on its site.

Space for staff. The staffing of the Regional Medical Library program has exacerbated an already critical situation. The main reading room of the Library has now been invaded by a photoduplication ma-

chine from the Regional Photocopy and TWX Section. Although the remodelling of the Library workroom will soon get this machine behind the scenes, no alternative has been found to providing desk space in the reading room for the Regional Reference Librarian and her assistant. There is some logic to a firing line location for readers' service personnel, but it does create an air of creaturely activity in an otherwise gracious room. Members of the Medical Documentation Service staff have also overflowed into the Reading Room. The last "outsider" occupant of a study room has now been dispossessed in anticipation of regional staff additions. Time has been borrowed by finding desk space in the workroom for the newly appointed MEDLARS Search Formulator, but the Library Administration pointed out previously spurned basement rooms as candidates for remodeling to the Visiting Committee when they toured the building.

Staff. Staff shortages are suggested by growing backlogs of work in the Processing Department, in the handling of binding shipments, in "home" binding of less-used materials, in recording and shelving of dissertations, and in the sorting and shelving of incoming gifts. Workloads are so heavy that absences for illness or vacations create backlogs in such routines as photoduplication and shelving which must be kept on a current basis.

The ever-spiralling cost of living, increases in taxes and social security payroll deductions, and higher salaries in neighboring institutions resulting from heightened competition for competent personnel, all place strains on the loyalty and morale of a staff which has demonstrated its devotion to the College. Fiscal stringencies last year limited increases to a cost-of-living adjustment which was out of step by the time it was put into effect.

Personnel. As the report year drew to a close, the Libary Administration regretfully acceded to Miss Muriel Zeldis' request to be relieved of her duties as Head of the Processing Department. She had served the College Library for fourteen years as Head of the Serials Department, then as Cataloger, and finally as Head of the Processing Department. Mrs Sarah Caspari has been appointed to the College Library staff to fill this vacancy.

During the year, the Serials Department lost the services of Miss Barbara Maurer who resigned to rejoin her family in California. In addition to her Serials Department duties, Miss Maurer supervised the work of the Photocopy and TWX Section during the period when it was funded by the Resource Grant. Miss Virginia Thomas who provided evening and Saturday coverage in the Periodicals Room discontinued her employment at the end of the academic year. Miss Candace Westover also served in this Department for a short time.

Mr. Joseph McCabe worked during the summer months shelving duplicate journal issues in the basement. Mr. Samuel M. De Phillippo, who served as a part-time page, discontinued his employment to devote full time to his studies. Other staff members who served as pages for short periods of time were Jetta James, Nancy Jessen, Geri Ann Kephard, Marlyn Merritt and Leslie Payton.

Mrs. Janet Hennegan resigned her position of Historical Assistant when family plans forced her to leave the city.

Professional staff activity. The Library was represented at the 67th Annual Meeting of the Medical Library Association in Denver by Mrs. Beatrice F. Davis, Mrs. Lisabeth M. Holloway, Miss Alberta Berton, Miss Muriel Zeldis and Mr. Elliott H. Morse. Miss Alberta Berton also attended the meeting of the Special Libraries Association in Los Angeles. She is chairman of the Sci-Tech Group of the Special Libraries Council of Philadelphia & vicinity and is a member of the Board of Directors of the Council. Miss Berton's other professional

commitments are noted in the Medical Documentation section of this report.

Miss E. Naomi Frazer is Chairman of the Social Sciences Group of the Special Libraries Council of Philadelphia and Vicinity and is a member of the Board of Directors of the Council.

Mrs. Beatrice F. Davis presented a paper on "What to Collect and How" at a Workshop on Archival Collections sponsored by Drexel Institute of Technology and the Free Library of Philadelphia. She talked to the Drexel Institute Student Chapter of the American Society for Information Science in September on Regional Library Service. She also attended a Colloquium on Personnel Administration and Management.

Mrs. Joyce Mingledorff, Mrs. Faye Rastegar and Miss Carol C. Spencer wrote papers on the first quarter's activity of the Regional Medical Library Program which they delivered to the joint meeting of the Regional Medical Library Committee and the Regional Planning Council which was held in November.

Mr. Elliott H. Morse is currently the Vice-President of the Medical Library Association and serves on its Board of Directors. He gave a paper on "Regional Medical Libraries" and participated in a panel discussion at the Meeting of the Southern Regional Group of the Medical Library Association in Atlanta in October. He attended an all-day briefing session at the National Library of Medicine, held in October for the program directors of the MEDLARS Stations and Regional Libaries. He presented a paper on Interlibrary Cooperation at the American Hospital Association's Institute on Library Service held in Philadelphia in October.

Special acknowledgement. The Librarian's "Citation" for distinguished service this year goes to Francis C. Wood, M.D., President; George I. Blumstein, M.D., Vice President, and W. Wallace Dyer, M.D., Executive Director, for securing the services of Mr. Dennis Dougherty as Comptroller of the College. Thanks, too, to Mr. Dougherty for the speed and efficiency with which he has shouldered the fiscal management load which was the Librarian's greatest source of concern. Honorable Mention must go to Mr. Theodore Kolodziejski, the Superintendent, for building "miles" of wooden shelves in the basement for duplicate storage, for remodelling study rooms for the Regional Library Program and for installing a number of air conditioners in a building which was designed long before architectural provisions were made for such modern conveniences.

Special thanks go to the Community Service Institute and to the Robert H. Ivy Society for their interest in strengthening the Library's resources in the fields of forensic psychiatry and plastic surgery, respectively.

Mrs. Lisabeth M. Holloway earned special recognition for overseeing the renovation of the Wood Room.

Benefactors. A list of donors of books and other library materials appears in the statistical section of this report.

The Library acknowledges its gratitude to the following institutions which have shared the operational costs of the College Library this year:

NON-PROFIT INSTITUTIONS

Albert Einstein Medical Center (Korman Research)
Albert Einstein Medical Center (Medical Staff)
Alfred I. du Pont Institute
Allentown Hospital Staff
Antioch College-Fels Research Institute
Bryn Mawr Medical Staff & Hospital
Burlington County Memorial Hospital Medical Staff
Chestnut Hill Hospital Medical Staff
Crozer-Chester Medical Center
Delaware Academy of Medicine
Fitzgerald-Mercy Hospital Staff
Germantown Dispensary & Hospital Staff
Hahnemann Medical College & Hospital
Harrisburg Hospital
Hospital of the University of Pennsylvania
Institute for Cancer Research

Institute for Medical Research
Jefferson Medical College
Mercer Hospital, Medical-Dental Staff
Methodist Hospital Staff
Pennsylvania College of Podiatric Medicine
Pennsylvania Hospital
Philadelphia College of Osteopathic Medicine
Philadelphia General Hospital
Presbyterian-University of Pennsylvania Medical Center
St. Luke's Hospital, Bethlehem
Temple University School of Medicine
U. S. Veterans Administration Hospital, Philadelphia
University of Pennsylvania Department of Pharmacology
University of Pennsylvania Graduate Hospital
University of Pennsylvania Medical School
Woman's Medical College

CORPORATE INSTITUTIONS

American Cyanamid Company (Lederle Laboratories)
American Electronic Laboratories, Inc.
Atlas Chemical Industries
Borden Chemical Company
Campbell Soup Company
Carroll Dunham Smith Pharmacal Company
Ciba Corporation
Cohen & Verlin, Attys.
Cooper Laboratories, Inc.
Council for Tobacco Research
Dechert, Price & Rhoads
E. I. duPont (Haskell Laboratories)
E. I. duPont (Lavoisier Laboratories)
E. I. duPont (Stine Laboratories)
Ettinger, Poserina, Silverman, Dubin, Anapol & Sagot, Attys.
FMC Corporation (American Viscose Co.)
Freedman, Borowsky & Lorry, Attys.
General Electric Company
General Technical Services, Inc.
Hoffman-LaRoche, Inc.
Information Interscience Inc.
Institute for Scientific Information
Institute for Technical Translation
International Pharmaceutical Corporation
Kisselman, Devine, Deighan & Montano
Krusen, Evans & Byrne
Lea Associates
McNeil Laboratories, Inc.
Manchel, Lundy & Lessin, Attys.
Mead Johnson & Company
Merck & Company
Merck Frosst Company
National Drug Company
Norwich Pharmacal Company
Pennsalt Chemicals Corporation
Chas. Pfizer & Company, Inc.
Pepper, Hamilton & Scheetz, Attys.
Radio Corporation of America
Richter, Lord, Cavanaugh, McCarty & Raynes, Attys.
Rohm & Haas Company
William H. Rorer, Inc.
Samson Laboratories
Schering Corporation
Joseph D. Shein
Smith Kline & French Laboratories
Paula Stone
Verlin, Goldberg, Ellis & Epstein, Attys.
Wyeth Laboratories

ELLIOTT H. MORSE
Librarian

STATISTICAL SUMMARY
INVENTORY

	1968	*1967*
Accessioned items[1]*:*		
Incunabula[2]	421	421
Manuscripts and typescripts	1,326	1,315
General	243,402	237,965
Accessioned pamphlets	8,775	7,999
	253,924[3]	247,700[4]

[1] Accessioned items in this library comprise the total number of bound volumes and such unbound pamphlets as have been cataloged as separate bibliographical units regardless of their size.

There remain many thousands of unaccessioned pamphlets awaiting accessioning and cataloging. A true quantitative and qualitative picture of the library's holdings cannot be presented until this wealth of neglected material has been processed and duly registered in our 'accessioned' count.

[2] The Library owns 423 incunabula, but there are two cases of two bound together, reducing the number of accessioned items.

[3] Included in these figures are the following collections which are on permanent deposit in the

Unaccessioned items[1]:		
Reports	28,820	28,818
Theses	62,342	62,497
Pamphlets and reprints	228,536	228,528
	319,698	319,728

Accessioned Acquisitions:

1968: 6,224 (2,811 by purchase; 2,938 by gift; 475 by exchange). (Books: 2,681; Periodicals: 2,767; Pamphlets: 776).

1967: 5,963 (3,049 by purchase; 2,343 by gift; 57 by exchange). (Books: 2,428; Periodicals: 3,097; Pamphlets: 438).

Non-accessioned acquisitions:

1968: 141 items (Reports, 2; Theses, 99; Miscellaneous, 40).

1967: 237 items (Reports, 2; Theses, 200; Miscellaneous, 35).

Currently Received Serials

	Subscription	*Gift*	*Exchange*	*Totals*
U.S.A.	528	458	62	1048
Western European Continent	976	82	130	1188
Eastern European Continent	142	44	66	252
United Kingdom and Eire	172	32	32	236
Asia (including Japan)	87	90	78	255
Latin America and West Indies	47	57	78	182
Canada	14	12	6	32
Pacific (including Australasia)	9	10	9	28
Africa	2	7	18	27
Grand Total 1968 (Dec. 31)	1,977	792	479	3248[5]
Grand Total 1967 (Dec. 31)	1,808	824	456	3088[5]

New Titles: A total of 93 new serial titles was added in (1 Nov. 1967–31 Dec. 1968). Separate issues received, checked in the Kardex record and shelved totaled 23,946.

The previous geographic designations "International" and "U.N." have been dropped. Journals in these old groupings have been redistributed in other categories on the basis of place of publication.

Readers' Use of the Library

Library Hours: The Library was open, during the academic year, from 9:00 A.M. to 9:30 P.M. on Mondays and Wednesdays, from 9:00 A.M. to 5:00 P.M. on other weekdays. During June, July, August, and until the first Monday after Labor Day, the Library was open from 9:00 A.M. to 9:00 P.M. on Tuesdays and from 9:00 A.M. to 5:00 P.M. on other weekdays, except Saturdays, when it was closed. The following legal holidays were observed: Thanksgiving, Christmas, New Year's, Memorial, Independence, and Labor Days.

Visitors:

	Reading Room	*Periodicals Room*	*Totals*
1968	8,802	3,804	12,606
1967	9,557	4,295	13,825

Library: Gross Library, 3,976 accessioned items; Parry Library of the Obstetrical Society of Philadelphia, 217; Mütter Museum, 200 (Mütter Museum books may not be removed from the College building).

[4] This figure for December 31, 1967, differs from the figure of 246,741 given in last year's report which was as of October 31, 1967.

[5] Titles are only included in this count if issues were received in 1967 or 1968.

Circulation:

	Intra-Mural[6]	*Extra-Mural*	*Totals*
1968	27,450	35,464	62,914
1967	33,425	37,525	70,950

	Books	*Journals*	*Totals*
1968	11,749	51,165[7]	62,914
1967	11,670	59,280[8]	70,950

Interlibrary Loans: The Library sent 47,706 (1967: 40,493) volumes on interlibrary loan to 309 (1967: 353) libraries in 29 (1967: 41) states, Canadian provinces and foreign countries. Included in 1968 figures are 19,276 articles photocopied with Resource and Regional Grant support, but not the photoduplications noted immediately below.

Photoduplications: 171,453 pages were photocopied on request (1967: 159,685). Users of this service reimburse the College Library for copying and bookkeeping costs.

Donations

The donors for the past year number 89 (1967: 98). The library is indebted for large gifts of books, pamphlets and unbound periodicals to the following donors: W. A. Bolhofer, Drs. V. Del Duca, M. D. Kasser, National Foundation, Miss M. E. Percival, Mr. A. Sevag, Smith Kline & French Laboratories, Temple University, Wallace Laboratories, Woman's Medical College.

Various publishing houses, among the large group of corporate donors, have presented volumes as follows: F. A. Davis Company, 32; Lea & Febiger, 26; J. B. Lippincott Co., 48; W. B. Saunders Co., 70.

Other individual donors were as follows: Mr. R. E. Asnis, Drs. D. M. Aviado, O. V. Batson, W. S. Blakemore, T. Butterworth, T. D. Duane, G. E. Farrar, Jr., J. T. Flynn, J. Freeman, J. Q. Griffith, Jr., Mr. H. M. Hamill, Sr.; Drs. E. J. Huth, R. A. Kern, J. R. Kitchell; Klein Family; Mr. P. Krumbhaar; Drs. M. D. Kushner, J. J. B. Light; Miss C. Mallon; Dr. B. Malzberg; Mrs. G. J. Martin; Drs. S. Mudd, E. J. Neren, S. X Radbill, F. B. Rogers, E. K. Rose, C. E. Rosenberg, T. G. Schnabel, A. R. Shands, Jr., G. C. Shattuck, P. D. Shore, I. Stein, P. E. Steiner, F. W. Sunderman, and L. B. Wingard, Jr.

The *Transactions* & *Studies* was sent, either in exchange or as gift, to 569 organizations.

Theses and dissertations to the number of 343 have been received on exchange from the following European schools of medicine: Universities of Bern, Copenhagen, Erlangen, Geneva, Karolinska Institute, Lausanne, Leiden, Liège, Louvain, and Uppsala.

Library's Historical Collections

1. Curator's Report

As indicated below, the much appreciated Grant from the American Philosophical Society has resulted in a considerable extension of the accessibility of the library's historical collections, thanks to the indefatigable resourcefulness of the Associate Curator and the conscientious labors of her assistants during the calendar year: Mrs. Elizabeth Bready, Mrs. Janet Hennegan, Mrs. Margaret Henry, Mr. Steven Peitzman and Miss Halina Wierzbicki.

Acquisitions. The library's holdings in the fields of cancerology and tuberculosis were notably enriched by collections covering these fields that were donated by, respectively, the Institute for Cancer Research and a distinguished Fellow of the College, Dr. Esmond R. Long. A few of the other interesting acquisitions may be briefly recorded as follows:

1. Emerson, Samuel (1765–1851). An Oration on Medicine. Delivered at Berwick . . . in June, 1801. Before the Medical

[6] The number of volumes "consulted in the library" includes only those supplied on demand. Readers have access to the bound volumes of periodicals and reference works kept on the shelves in the Reading Room; the Fellows, and occasionally others, by special permission, have access to the book stacks. There are, therefore, many volumes consulted of which no accurate record can be kept.

[7] This figure includes 5426 unbound current journal issues circulated from the Periodicals Room.

[8] This figure includes 6,845 unbound current journal issues circulated from the Periodicals Room.

Society of the County of York. Portland [Maine], 1801. (Austin lists five copies of this pamphlet, none of them in this State.)

2. Fry, George S. Memorandum Book: [manuscript, chiefly recording the lectures, 1820, of Dr. Thomas C. James, Professor of Midwifery at the University of Pennsylvania, and an early Fellow of the College. The volume was formerly the property of a descendant of Dr. Fry, the Rev. Dr. Cecil F. Ristow, of Des Moines, Washington, who has recorded his pleasure over Dr. Patricia J. Middleton's donating it to our library, at the suggestion of Dr. Fred B. Rogers.

3. Galen. De ratione curandi . . . interprete Martino Acakia . . . Venice, Giunta, 1547. (Gift of Samuel X Radbill, M.D.)

4. Linden, John. Manuel of the Exanthematic Method of Cure, also Known as Baunscheidtism . . . 14th ed. [Cleveland], 1878.

5. Lister, Martin (1638–1711). Dissertatio de Humoribus. London, 1709. (Signature of John Redman Coxe on the titlepage.)

6. Louis, Antoine (1723–92), "the pioneer in applying medical knowledge to courtroom practice" (Garrison): six tracts, all 18th c. imprints, bound together.

7. Mitchell, S. Weir (1829–1914). [Nine Mitchell imprints, six of them bearing inscriptions by the author. Presented by Mr. Hugh M. Hamill, Sr.]

8. Morison, James (1768–1850). Morisoniana; or Family Adviser of the British College of Health. 3d ed. London, 1831. (Gift of Prof. Charles E. Rosenberg)

9. University of Pennsylvania. Medical diploma (awarded to James Russell Smith, of Pennsylvania), 1819, displaying the signatures of Philip Syng Physick, John Redman Coxe, Nathaniel Chapman, Thomas C. James, and Robert Hare. [Presented by Samuel B. Sturgis, M.D.]

Exhibits. Appropriate exhibits were prepared for the meetings of the Section on Medical History, as usual. An exhibit of early illustrated herbals was prepared by Mrs. Holloway in deference to the College's involvement in the Center City House Tour, which, at the same time, introduced the visitors to the College's Herb Garden. The Curator, further, prepared an exhibit of printed materials on Water Pollution, as an adjunct to the College's forum on that subject; and an exhibit based on William Gibson's book "Young Endeavour; Contributions to Science by Medical Students of the Past Four Centuries," this last endeavor originating in a similar exhibit which had been prepared at the Yale Historical Medical Library by Miss Madeline E. Stanton, who generously supplied us with a list of the items exhibited.

Fugitive Leaves. Owing, in large part, to other obligations, it was found possible to issue only one number of our *Fugitive Leaves from the Library* (N.s., no. 91, Feb./March, 1968) in the calendar year. This reproduced a rare and important document in the history of American medical education and legislation that came to light in the course of our cataloguing program: "Proceedings of a Convention of Medical Delegates, held at Northhampton, in the State of Massachusetts, on the 20th Day of June, 1829."

W. B. McDaniel, 2d
Curator of Library Historical Collections

2. Report of the Associate Curator and Cataloguer of Historical Materials

Items Catalogued

Books added to the collection (including early works and current works on the history of medicine, and gift books)	680
Pamphlets (including those catalogued on the APS grant)	826
Pictures, documents, and manuscripts	314
Books and pamphlets recatalogued (because of misleading cards, erro-	

neous entries, or misleading location symbols)	134
Volumes added to existing serials or sets	72
	2,026
Cards Prepared	12,395

Special Activities

Housekeeping. We are pleased to report the completion of one of our long-term projects, at least as far as pre-1800 collections are concerned: all the leather-bound books prior to this date have been treated with leather dressing, and many in poor condition have been housed in acid-free paper slipcases specially tailored to their measurements. This has been the work of our part-time Page, Miss Halina Wierzbicki. Fourteen books of unusual importance have been rebound by Mr. Fritz Eberhardt in a style and with materials suitable to their age and value.

A new "housekeeping" project was undertaken in August, at the request of the Librarian. This is the systematic checking of gift books (neither very new nor very old) accumulated by the Library, and their subsequent cataloguing, or appropriate disposition. It is hoped that needed stack space will result from this effort.

Sale of Historical Duplicates. Five lists were offered during 1968. Two of these were the "regular" semi-annual miscellaneous lists; one consisted entirely of duplicates from the gift of a single Fellow, who requested that such items as the College did not require be offered to other libraries; one was a special list of historical materials on smallpox and vaccination, and the last was a special list on cancer. Through all these lists, and through "non-listed" sales, 339 items of historical interest were disposed of.

American Philosophical Society Grant. In April, 1968, the American Philosophical Society announced the award of $12,000 (to be paid over a two-year period) to the Historical Department of the Library of this College, for the advancement of three projects: 1, the compilation (with much necessary recataloguing) and issuance of a catalogue of the major manuscripts of this Library (single-page documents, autographs, and letters being excluded); 2, the production and issuance of a similar catalogue of the portrait engravings belonging to the College, numbering perhaps 3,000; 3, the continued cataloguing of the College's innumerable pamphlets. The third of these projects was begun on a part-time basis by Mrs. Elizabeth Bready, who has processed 394 pamphlets since October 1, 1968, with the assistance of Mr. Steven J. Peitzman as searcher. The Associate Curator expects to begin the first-named of these projects in February 1969, with the objective of eventual publication of the resulting manuscript-catalogue in the *Transactions & Studies of the College of Physicians of Philadelphia.* Compilation and publication of the second project, the catalogue of engraved portraits, will follow upon completion of the manuscript-catalogue.

L. M. Holloway
Associate Curator

Medical Documentation Service

In January 1968, technological advances in data processing systems in the form of on-line shared computer time with an IBM 360, made it possible for MDS to introduce this new method of direct impression computerized typography as a means of graphic arts preparation of camera ready copy for our three publications, namely *Birth Defects, Influenza* and *Cystic Fibrosis.* The equipment became available toward the end of 1967, and full scheduling of MDS publications became operational at the beginning of this calendar year. Mrs. Elizabeth Wright, who had previously been trained at the IBM Training School, was certified as a Data Computer Operator, and assumed full responsibility for the programming of these publications.

In addition to preparing text for the above publications, the new equipment

enabled us to develop a thesaurus for indexing both *Birth Defects* and *Influenza*, the result of which brought authorization from the National Foundation to prepare and include a six month index and an annual index in future issues of this publication. They further requested that we develop by computer methods a four year index to prior volumes of *Birth Defects*, which project was completed and has recently been published. Furthermore, the Cystic Fibrosis Foundation was so impressed by the function and successful production of their material for publication, that they too authorized publication from this office, rather than by methods they had previously used.

The capability of this on-line terminal has made it possible to begin work on a List of Periodical Holdings for the College Library as a project for the Regional Program. This work, only recently begun after considerable research and effort to coordinate with already existing programs in other libraries in the region, is now on full schedule. It is hoped that these early beginnings will lead to a full Union List for the Regional Program.

The Director is also Editor and Business Manager of the JIM List (a publication of the Philadelphia Regional Group of the Medical Library Association). It is anticipated that the College Library Holdings List already in computer disc storage can be utilized to structure future issues of the JIM List.

Contact with area biomedically interested industries made it possible to add new users of the Alerting Service which now scans over 71 interest profiles in all languages.

The existing policy of providing Fellows of the College with five hours' free searching time has been continued. Approximately *44* Fellows have utilized this service, resulting in some *119* free hours of service, representing what might have been *$1,012* of paid service.

A new service of the staff this year was the placing for publication of articles written by Fellows of the College in appropriate journals. Relationships with publishers of medical literature made such an addition of services possible. Staff members have researched material for new articles, outlined and drafted manuscripts to be published, and edited articles provided for this purpose by Fellows of the College.

As a member of the Planning Committee for the 6th International Information Retrieval Colloquium to be held at the Warwick Hotel on May 8th and 9th of this year, the Director has contracted to publish the Proceedings of this Colloquium, another new activity of the Medical Documentation Service.

As National Treasurer of the Pharmaceutical Division of the Special Libaries Association and Business Manager of COPNIP (a publication of that Division), the Director of MDS has also become involved as a volunteer in publishing this widely circulated aid to the pharmaceutical industry.

At the termination of our three year contract to publish *Influenza*, a new Grant Proposal was submitted to NIH, and an Award was received for the renewal of this contract for the ensuing three years, 1968–71.

We have also received a commission to aid in the revision of a textbook in the field of orthopedics, and this research and composition has been added to the functions of the department this year and will continue for possibly another year.

Several proposals have been submitted to government agencies as well as private industry, and it is hoped that these will come to fruition before the end of this fiscal year.

Along with the many changes in operational methods, MDS has also undergone many changes in personnel. At the end of

the summer, Dr. Eleanor Ashkenaz resigned to resume her activities in the teaching field. Miss Alberta D. Berton was named Director of MDS by the Library Committee early in the fall. Miss Linda Frantz assumed full responsibility for the Alerting Service and the supervision of Miss Inger H. Robinson and Ivan Kalmar who share in the scanning of the literature. Both Miss Robinson and Mr. Kalmar joined the staff as linguists, and can handle most of the languages in which our foreign journals are published. Miss Yoshi Nakayama, a graduate of Columbia University, joined the staff to coordinate and conduct retrospective searches. Mrs. Pearl Stark, a capable and experienced literature scientist with advanced training in biology and genetics, joined the staff as editor and advisor in the scientific activities of MDS. Dr. Alfred Lisi, our newest addition to the staff, comes to us with many years of experience as a teacher and literature scientist. Formerly an instructor of pharmacology at Jefferson Medical College, he has edited and written abstracts for many of the abstracting journals (*Carcinogenesis Abstracts, Gastroenterology Abstracts,* etc.). Miss Jean Carr, who has been with MDS for many years, continues in her capacity as Executive Secretary, and her capable and far reaching skills, as well as her pleasant and cooperative spirit, are an asset which never ceases to benefit the department. Mrs. Eleanor Taylor continues in her capacity of Bibliographer, and it is in her capable hands that much spade work in problem areas is carried out. A new addition to our clerical staff this year was Miss Linda Justice, a newly trained Datatext operator, who joined the staff to aid in the expanding program our Call 360 has made possible.

Former staff members who are no longer affiliated with MDS at the end of the year are Mrs. Marianne Das, Miss Bethrotha Dent, Mr. Robert Blackerby and Mrs. Cassandra Donovan.

While MDS suffered for many months from the loss of personnel, which curtailed efficiency of operation during this period, the undeniable fact of the extremely rare qualities of each of our new staff members, should, in future months and, it is hoped, years, provide us with the capabilities to accept many new challenges and to embark on numerous projects which will expand the services of MDS and enable it to assume an increasingly significant role in the activities of The College of Physicians Library.

Three Year Comparative Statistics, 1965–1968

	Nov. 1, 1965 to Oct. 31, 1966	*Nov. 1, 1966 to Oct. 31, 1967*	*Nov. 1, 1967 to Dec. 31, 1968*
Scanning References Reported	6,944	8,746	10,442
Average Number of Subjects	29	34	71
Abstracts			
English	1,220	809	1,066
Foreign	355	395	648
Totals	1,575	1,204	1,714
Literature Searches and Bibliographic Services*	208	316	328*
Translations	179	124	81

* Added to the statistics above, approximately six clients are provided telephone bibliographic service on demand, which constitutes at least 3–5 requests per day for this service. If counted in the above, a figure of 1250 would have to be added, representing the year's requests for this service.

Alberta D. Berton
Director

The Staff[9]

Librarian

Elliott H. Morse

Assistant to the Librarian

Mrs. Beatrice F. Davis

Library Secretary

Mildred C. Gray

Processing Dept.

Mrs. Sarah Caspari, *Head*

Cataloger

Carmine Salvato

Assistant Cataloger

Mrs. Kathyrn Miragliotta

Junior Assistant

Josefa Sereda

Reference-Circulation Dept.

Readers Service Assistants

Mrs. Eileen Binckley
Juneann Kasperowicz, Jr. Ass't.
Mrs. Kathryn Bernice Odom*
Matilde Zalinsky

Serials Dept.

Mrs. Marybeth Leary, *Head*

Serials Assistants

Mrs. Catherine Ledwell
E. Naomi Frazer
Matilde Zalinski
Thea J. Fischer*
S. Augustus Young*

Historical Collections

W. B. McDaniel, 2d, Ph.D., *Curator*
Mrs. Lisabeth Holloway, *Associate Curator and Historical Cataloger*
Mrs. Margaret Henry, *Historical Ass't.*
Judith A. Kimmel, *Historical Ass't.*
Halina T. Wierzbicki, *Historical Ass't.**

American Philosophical Grant Program

Mrs. Elizabeth Bready, *Cataloger**

Regional Medical Library Program

Carol C. Spencer, *Head, Evaluation Section*
Mrs. Joyce S. Mingledorff, *Head, Regional Reference Services*
Christine Kislo, *Regional Reference Services, Ass't.*
Lee J. Tanen, *MEDLARS Search Formulator*

Regional Photocopy & Teletype Section

Mrs. Faye Rastegar, *Head*
Linda Howell
Elizabeth Bertram
Mrs. Carol Stills

Approved:
Samuel X Radbill, M.D.
Chairman, Library Committee

Medical Documentation Service

Alberta D. Berton, *Director*
Jean P. Carr, *Executive Secretary*
Linda S. Frantz, *Lit/Sci/Supervisor Scan. Ser.*
Linda Justice, *Datatext Operator*
Ivan Kalmar, *Foreign Lit/Scan.**
Alfred G. Lisi, Ph.D., *Abst/Editor*
Yoshi Nakayama, *Lit/Search Coordinator*
Inger H. Robinson, Foreign Lit/Scan.*
Mrs. Pearl Stark, *Lit/Sci. Editor*
Mrs. Eleanor Taylor, *Bibliographer*
Mrs. Elizabeth Wright, *Coordinator Datatext Oper.*

Paging Staff

Andrea L. Jancsura, Jr. Ass't.
Veronica M. Enright
LaVerne K. Pittman
Donna Parks
Carol Sapp
Jean Conley
Patricia Boyle
Patricia Porter*
Stephan Bilynsky*

* Part-time workers

[9] Library Staff list as of January 20, 1969.

Annual Report of the Committee on the Mütter Museum and College Collections

When one considers the growth of the College library and the many other changes in the College building in order to accommodate new members on the staff, it may appear that the Mütter Museum with its old bones, human organs and medical relics has remained static. This is not the case. Large groups of students continue to inspect and study its many treasures, and its friends continue to add to the College Collections.

Besides the many individuals who visited the museum from all parts of the United States and foreign countries, large groups studying in various fields have kept the museum busy. We try to be helpful to all persons seeking information. Unfortunately, we are not always able to comply because some of our old specimens came to the museum years ago with no case histories, although some of them might have had interesting ones.

Dr. James F. Toole of the Bowman Gray School of Medicine, Winston-Salem, North Carolina, asked for photographs of the material on the Siamese Twins, Chang and Eng Bunker. He also requested that a biopsy of their livers, which are also in the museum, be taken to determine if any new tissue information could be obtained. This was done by Dr. Hans Popper, but the results were negligible because of the aged condition of the organs.

Mr. Robert Ramsey of Smith, Kline & French Laboratories was given permission to photograph several diagnostic instruments to be used to illustrate an article that appeared in their publication, "Emphasis," and was kind enough to send us a copy of the photographs.

No Thomas Dent Mütter Lecture was delivered this year because two lectures were given in 1966. The 80th one was delivered on January 8, 1969, by Ernest E. Aegerter, M. D., Professor of Pathology and Director of the School of Medical Technology at Temple University School of Medicine and Hospital. His subject was "Metabolic Bone Disease: Facts and Fancy."

Student nurses are showing an increased interest in the museum. They now come from St. Joseph's Hospital School of Nursing, James Martin School of Practical Nursing, Abington Hospital Nursing School, Chestnut Hill Hospital, Memorial Hospital in Roxborough, and the Montgomery Hospital in Norristown.

Various public schools in Philadelphia and surrounding areas send their biology classes or clubs to visit us and they too seem to derive benefit from it. The students from the Junior and Senior High School in Claymont, Delaware, are especially welcome for they are an interested and attentive group.

From the Dobbins Vocational School we get students of medical technology and those studying to be medical secretaries.

Clifton Heights High School students, with the school nurse in attendance, have been coming each year for the last twenty-nine years.

Large groups have come by bus from the Kennedy High School in Willingboro and the Lenape Regional High School in Medford, New Jersey, during the last few years. In fact, they sometimes send two groups during the year.

The Wagner High School in Philadelphia again sent a biology class to the museum, as they have for several years. Collingswood High School students, accompanied by instructors, made their first visit this year, but we were assured

that it would not be their last. Eight students with Mrs. William R. Carman, their instructor, studying biology, physiology and chemistry, also made an intial visit.

Dr. Fred B. Rogers brought his freshmen class of medical students from Temple University School of Medicine for a tour of the library and museum. There were about one hundred in the group. There was also a large class from Hahnemann Medical College and a maternity nursing class from the University of Pennsylvania.

Jefferson Medical College was also represented by the Hobart Hare Honorary Medical Society and its faculty patron, Dr. Robert I. Wise.

Sketching was a part of the assignment of the students who came from the Moore College of Art under the direction of Mrs. Ben Eisenstat, and others also came from the Philadelphia College of Art.

Young men and women from the Franklin School of Arts and Sciences come to the museum almost daily. The school is only a short distance from the College and they take advantage of its proximity.

Each year individuals and small groups from the Philadelphia College of Pharmacy and Science and the Pennsylvania College of Optometry find time to browse and obtain information about the exhibits. The wax models of eye diseases seem to especially interest the optometry pupils.

We were pleasantly surprised to be called upon to play host to a delegation from the International Herb Society and to a great many members of the American Hospital Association Institute.

There were many interesting donations during the year; these are listed in the College Collections report. As mentioned previously, this has been done in recent years even though the item might be museum material, so that they may be loaned or exchanged and are not subject to the terms of Dr. Mütter's will, which does not permit anything in the museum collection to be removed from the building.

The museum is open Monday thru Friday from 9 A.M. to 5 P.M.

Mrs. Ella N. Wade was reappointed curator for the year 1968–9.

College Collections

Gifts to the College in 1968 were numerous and interesting. A very unusual surgical instrument that was found in the home of Dr. Ephraim McDowell in Danvill, Kentucky, was presented by *Mr. A. M. Lane, Jr.*, of the Scott Paper Company. This resembles closely a utility gadget that used to be found in many a small boy's pocket. It usually contained a blade, a bottle opener, a cork screw and other devices, while this one contains small surgical instruments similar to those found in the old pocket cases. It is over 200 years old and is of German manufacture.

Dr. Robert C. Friedman, of Temple University Hospital, who is a frequent visitor here, gave us a veterinary fleam containing three knives. This is similar to one found in Washington's home at Mt. Vernon, dated 1732, which some biographers think might have been used to bleed Washington in his last illness.

A framed diploma of the College of Medicine of Philadelphia issued to Paul Brewer in 1841 was a gift from *Miss Celestine Mallon*.

The late Dr. Stanley P. Reimann left two items to the Institute for Cancer Research and *Dr. Timothy R. Talbot* presented these to the College. One is a wooden stethoscope bearing the inscription, "Meinen Freund Dr. A. Kroner-Weihnachten 1884—Prof. Theodor Billroth," and the other is a Liebreich ophthalmoscope.

A member of the Mütter Museum Committee, *Dr. William I. Gefter*, received a box of rectal dilators and an electrical diathermy instrument in exchange for a

St. Louis Exposition medal. These items were added to the collection.

Until recently we had nothing catalogued under "insignia." We were obliged to remedy this because *Dr. Joseph Hirsh* of Temple University School of Medicine presented us with ten military medical insignia from Lebanon, Germany and Switzerland, and three small cases showing United Army Medical Insignia from 1896 to 1902. These make an effective display.

Dr. Fred B. Rogers presented a small silver Ship Surgeon's Insignia combining a caduceus and a fouled anchor.

Dr. William N. Parkinson presented an all-steel hypodermic syringe in a suede-covered aluminum pocket carrying case, date 1910, and early rustless hypodermic needles made by Becton, Dickinson & Co.: a gold needle on a steel case, which often broke off at the hilt, date 1916; subsequent all-gold needle, date 1918. Mr. Harry Alessi, Jr., Product Manager of Becton, Dickinson & Co., was happy to hear that we had the needles and will stop in to look at them.

We seldom get pathological material anymore, but *Dr. Esmond R. Long* brought from Washington a frog tumor prepared by the late Dr. Balduin H. E. Lucké. It is an adenocarcinoma of the kidney with liver and ovary metastasis.

Dr. Sylvan Stool from Children's Hospital photographed many of the specimens from the Adam Politzer Collection of Tympanic Membranes. He later sent us an album of the photographs.

We received three pieces of statuary during the year. One was the head of Dr. Philip F. Williams donated by the *Obstetrical Society of Philadelphia. Dr. Allan Shuster* presented a bronzed plaster bust of Dr. George M. Coates. A small bust of René Laennec, in green patina, was presented by its sculptor, *Miss Charlotte Geffken.* A plaque of Edward Livingston Trudeau, done by A. de Bona in 1935, accompanied it.

Twelve framed caricatures that had belonged to Dr. Lucké, done by artist Wyncie King, were presented by Mrs. Lucké.

Another gift, of which we are very proud, is a copy of a portrait of Andreas Vesalius by Titian that is in the Pitti Gallery in Florence, Italy. This copy was executed by Adolfo Tagliaferri for *Dr. Julian A. Sterling* in 1963. Dr. Sterling recently presented the portrait to the College together with a photograph of the original painting.

Wax votive offerings from Antigua, Guatemala, were presented by *Dr. J. Monroe Thorington.*

A very fine exhibit showing the correlative anatomy of the bronchial tree and lungs, was presented by *Dr. John Franklin Huber.*

A Parry medicine bag and a sphygmomanometer were loaned to the Insurance Company of North America to be used to illustrate a talk.

Portraits, Incorporated, of New York City, borrowed the Robert W. Vonnoh portrait of Dr. S. Weir Mitchell for a special exhibit.

Work on the Richard H. Harte portrait, by Leopold Seyffert, was done by the Newman Galleries, and later Mr. K. A. Smith-Brunet, an artist from Boston, was commissioned by Dr. Harte's daughter (Mrs. R. Ellison Thompson) and his son to make a copy of the portrait which will be given to Pennsylvania Hospital. The artist used one of the rooms in the museum as a studio so those in the museum were able to see how a copy was made.

Mrs. Ella N. Wade was reappointed custodian of College Collections for the year 1968–69.

Fred B. Rogers, M.D.
Chairman

List of College Lectures, 1968

3 January 1968

MELLORS, ROBERT C. (Slow) Virus Infection, Autoimmunity, and Lymphoma: An Experimental Model of Human Disease (Theodore F. Bach Memorial Lecture III; *Transactions & Studies,* January 1969.)

2 March 1968

A Community Health Forum on "Drug Abuse: Legal and Ethical Implications of the Non-Medicinal Use of Hallucinogenic and Narcotic Drugs" (Mary Scott Newbold Lecture LXXXVIII, presented as a symposium; *Transactions & Studies,* October 1968.) Chairman: FRANCIS C. WOOD. Moderator: J. RUSSELL ELKINTON. Participants: DANA L. FARNSWORTH, HENRY BRILL, JONAL ROBITSCHER

2 April 1968

Joint Meeting of the Philadelphia County Medical Society and The College of Physicians of Philadelphia.

I. Presentation of Certificates to Physicians who have completed fifty years in the practice of medicine. Certificates awarded by John R. Harris, M.D., President, Pennsylvania Medical Society.

II. Presentation of the Strittmatter Award to Jonathan E. Rhoads, M.D., by John B. Montgomery, M.D., Chairman, Strittmatter Award Committee.

1 May 1968

OSSERMAN, ELLIOTT F. Clinical and Biochemical Studies of Plasmacytic and Monocytic Dyscrasias and Their Interrelationships (Hira S. Chouké Lecture VII; *Transactions & Studies,* January 1969.)

9 October 1968

MAYER, JEAN. Malnutrition in the Rich and the Poor (Alvarenga Prize Lecture XXVII; *Transactions & Studies,* April 1969.)

9 November 1968

A Community Health Forum on "Survival? Man and Water" (Mary Scott Newbold Lecture LXXXIX, presented as a symposium; *Transactions & Studies,* April 1969.) Chairman: FRANCIS C. WOOD. Moderator: EARL FINBAR MURPHY. Participants: RUTH PATRICK, SAMUEL S. BAXTER, M. GORDON WOLMAN

4 December 1968

KOPROWSKI, HILARY. Centaurs of 2001 (Nathan Lewis Hatfield Lecture LII; *Transactions & Studies,* April 1969.)

Transactions of the Sections

SECTION ON MEDICAL HISTORY

13 February 1968

THE HISTORY OF VIENNA GENERAL HOSPITAL. Erna Lesky, M.D. (Kate Hurd Mead Lecture XIX.)

28 May 1968

FREDERICK H. ALLEN, M.D., CHILD PSYCHIATRIST. William C. Adamson, M.D. (*Transactions & Studies,* October 1968.)

THE HISTORY OF CHILD PSYCHIATRY in PENNSYLVANIA. Lauren H. Smith, M.D. (*Transactions & Studies,* October, 1968).

THE HISTORY OF ADOLESCENT PSYCHIATRY IN PHILADELPHIA. Philip J. Escoll, M.D. (*Transactions & Studies,* October 1968.)

19 November 1968

DR. CHASE'S *Guide* FOR THE PHILADELPHIA MEDICAL STUDENT OF 1842. Claire E. Fox, PH.D. (*Transactions & Studies,* January 1969.)

DR. JOHN KEARSLEY, JR.: THE MAD TORY DOCTOR. Randolph Shipley Klein, A.M. (*Transactions & Studies,* January 1969.)

TRANSLATION OF HIPPOCRATIC MATERIAL GYNECOLOGIC WRITINGS. Ann Hanson.

SECTION ON OPHTHALMOLOGY[1]

18 January 1968

SPECTACLE GLASS INJURIES. P. R. Estlow M.D.*

ULTRASONIC AID IN THE EVALUATION OF LEUKOKORIA. Kurt A. Gitter, M.D.*, David Meyer, M.D.*, Richard H. White, Jr., M.D.*, Guillermo Ortolan, M.D.* and Lov K. Sarin, M.D.*

CILIARY BODY DIKTYOMA. Burt Kunin, M.D.* and Charles Steinmetz, III, M.D.*

CHOROIDAL HEMANGIOMA: DIAGNOSIS AND TREATMENT. Donald LeWin, M.D.*, William Tasman, M.D. and P. Robb McDonald, M.D.

15 February 1968

TRANSCLERAL PHOTOCOAGULATION OF THE CILIARY BODY. Zarko M. Vucicevic, M.D.*

EFFECT OF INCREASED OXYGEN TENSIONS ON THE EYE. Charles W. Nichols, M.D.*

LACY VACUOLIZATION OF IRIS PIGMENT EPITHELIUM IN DIABETICS. Myron Yanoff, M.D.*

INTRAOCULAR SPIROCHETES. Robert W. Hamilton, M.D.* and Ernest H. Christman, M.D.*

21 March 1968

OCULAR CHANGES IN HAND-SCHULLER DISEASE. Wendall Willis, M.D.* (Discusser: Lawrence Naiman, M.D.*)

OCULO-MOTOR ATAXIA. Charles Rickards, M.D.* (Discusser: Henry Baird, M.D.*)

STURGGE-WEBER SYNDROME. Joseph Parisi, M.D.* (Discusser: Robison D. Harley, M.D.*)

18 April 1968

AN ANALYSIS OF PROBLEMS IN FUNDUSCOPY. Moderator: Thomas D. Duane, M.D. Panel: P. Robb McDonald, M.D., William C. Frayer, M.D., Thomas Behrendt, M.D.*

17 October 1968

INDICATIONS FOR FLUORESCEIN RETINAL ANGIOGRAPHY. Thomas Behrendt, M.D.* and Edward A. Jaeger, M.D.

THE CHANGES IN THE MACULAR REGION FOLLOWING ANATOMICAL RE-ATTACHMENT OF THE RETINA. Lov K. Sarin, M.D.*

RETINOPATHY OF VON GIERKE'S GLYCOGEN STORAGE DISEASE. David B. Schaffer, M.D.* and Lester Baker, M.D.*

RETINOPATHY. Glen G. Gibson, M.D.

[1] Abstracts of the presentations at this Section customarily appear in the *American Journal of Ophthalmology* and *A.M.A. Archives of Ophthalmology*.

* By invitation.

21 November 1968

ALCOHOL AND TOBACCO AMBLYOPIA—AN HISTORICAL SURVEY. Edwin B. Dunphy*, Emeritus Professor of Ophthalmology, Harvard Medical School, and Emeritus Chief of Ophthalmology, Massachusetts Eye and Ear Infirmary, Boston, Massachusetts. (Thirty-first Annual de Schweinitz Lecture.)

SECTION ON PUBLIC HEALTH, PREVENTIVE AND INDUSTRIAL MEDICINE

8 April 1968

THE USEFULNESS OF MORTALITY AND SURVIVAL DATA IN EXISTING MEDICAL LITERATURE. Richard B. Singer, M.D. (*Transactions & Studies,* January 1969.)

25 November 1968

PLANNNG FOR COMMUNITY HEALTH. Arthur D. Nelson, M.D. (Arthur Parker Hitchens XII; *Transactions & Studies,* April 1969.)

[2] Abstracts of the presentations at this Section customarily appear in the *A.M.A. Archives of Otolaryngology.*

SECTION ON OTOLARYNGOLOGY[2]

17 January 1968

THE DIAGNOSIS OF ACOUSTIC NEUROMA. Paul Bucy, M.D.,* Professor of Surgery, Northwestern University.

20 March 1968

BEKESY AUDIOMETRY AND THE SISI TEST. Frederick Harbert, M.D., and I. M. Young, M.D.* (Discusser: Jurgen Tonndorff, M.D.*)

LARYNGEAL, CARCINOMA: THE APPLICATION OF A THIRD DIMENSION ON DIAGNOSIS AND TREATMENT. Gabriel F. Tucker, Jr., M.D. (Discusser: Joseph L. Goldman, M.D.*)

(Annual combined meeting with the Section on Otolaryngology of the New York Academy of Medicine, held at The College of Physicians of Philadelphia.)

20 November 1968

AUDIOLOGICAL FINDINGS IN SEROUS OTITIS MEDIA. Frederick Harbert, M.D., and I. M. Young, M.D.*

THE USE OF REGIONAL PEDICLE FLAPS IN HEAD AND NECK SURGERY. Eugene Myers, M.D.*

TECHNIQUES OF BRONCHOSCOPY: OLD AND NEW. William H. Baltzell, M.D.

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1967. Abbiss, Joseph W., St. Francis Hospital, 8th & Dupont Sts., Wilmington, Del. (19805)
1952. Abelson, Neva Martin, 220 Locust St. (19106)
1961. Adamson, William C., 1542 Susquehanna Rd., Rydal, Pa.
1968. Adams, Raymond E., 514 Cooper St., Camden, N.J. (08102)
1926. Adler, Francis Heed, 8870 Towanda St. (19118)
1959. Adlin, Albert, 1512 Lindley Ave. (41)
1949. Aegerter, Ernest E., 3400 N. Broad St. (40)
1953. Agerty, Horst A., 1111 N. 63rd St. (19151)
1960. Ainsworth, Thomas H., Jr., 960 County Line Rd., Bryn Mawr, Pa.
1964. Albert, Seymour M., 255 S. 17th St. (19103)
1963. Albright, Edwin P., 512 E. Mt. Airy Ave. (18)
1967. Alexander, Charles M., 930 W. Sproul Road, Springfield, Pa. (19064)
1958. Alexander, John Deaver, 590 E. Chestnut St., Coatesville, Pa. (19320)
1962. Alexander, John Dewey, Jr., 330 S. 9th St. (7)
1935. Alpers, Bernard J., 111 North 49th St. (39)
1960. Ames, Mary D., 260 St. James Place (6)
1961. Amsterdam, Gerald H., 1201 W. Olney Ave. (19141)
1962. Annesley, William H., Jr., 39 Glendale Road, Upper Darby, Pa.
1961. Anthony, Russell A., 385 Lancaster Ave., Haverford, Pa.
1961. Aponte, Gonzalo E., 1025 Walnut St. (7)
1930. *Appel, Kenneth E., 111 N. 49th St. (39)
1968. Apple, Stanley B., 333 West State St., Trenton, N.J. (08618)
1960. Arey, James B., 2600 N. Lawrence St. (33)
1959. Arkless, Henry A., 255 S. 17th St. (3)
1967. Armitage, Harry V., 400 E. 13th St., Chester, Pa. (19013)
1922. Arnett, John H., 2116 Pine St. (3)
1967. Aronson, Marvin E., Office of Medical Examiner, 13th & Wood Sts. (19107)
1952. Ash, Rachel, 326 S. 19th St. (19103)
1952. Aston, Melville J., 6 Circle Drive, Margate, N.J. (08402)
1944. Atkins, Joseph P., 1201 Knox Rd., Wynnewood, Pa.
1956. Atkinson, John B., 410 Township Line Rd., Havertown, Pa. (19083)
1935. Atlee, John L., Jr., 822 Marietta Ave., Lancaster, Pa. (17603)
1952. Atlee, William A., 822 Marietta Ave., Lancaster, Pa. (17603)
1963. Austrian, Robert, Hospital of the University of Pennsylvania (4)
1958. Ayella, Alfred S., Jr., 1213 S. Broad St. (47)
1937. Bacon, Emily P., 803 E. Darby Rd., Havertown, Pa. (19083)
1958. Baer, Samuel, 5123 N. Broad St. (41)
1959. Baird, Henry Welles, III, 2600 N. Lawrence St. (33)
1952. Baier, Howard N., 1333 Chestnut St. (19107)
1952. Baker, Howard W., 3401 N. Broadway St. (40)
1963. Baker, Richard B., 1851 E. Allegheny Ave. (34)
1967. Baker, Richard P., Jr., Misericordia Hospital (19143)
1946. Baker, Walter W., 255 S. 17th St. (3)
1963. *Balin, Howard, 330 S. 9th St. (7)
1957. Baltzell, William Hewson, 1530 Locust St. (2)
1969. Bannett, Aaron D., 1335-49 W. Tabor Rd. (19141)
1940. Barba, Philip S., 120 Erdenheim Road (18)
1943. Barden, Robert P., 8835 Germantown Ave. (18)
1939. *Barnshaw, Harold D., 526 Cooper St., Camden, N.J. (08102)

* S. Weir Mitchell Associate

1969. Baronofsky, Ivan D., Hahnemann Med. College & Hosp. (19102)
1957. *Barr, Stanley, 255 S. 17th St. (3)
1939. Bartle, Harvey, Jr., Glenbrook Medical Bldg., 864 County Line Rd., Bryn Mawr, Pa.
1963. Bassett, James G., 3300 Henry Ave. (19129)
1932. Batson, Oscar V., 3926 Pine St. (4)
1921. Bauer, Edward L., Alden Park Manor (44)
1933. Bauer, John T., 312 E. Second St., Moorestown, N.J.
1939. Baumann, Frieda, 200 N. Wynnewood Ave., Wynnewood, Pa.
1930. Beardwood, Joseph T., Jr., 1245 Highland Ave., Abington, Pa. (19001)
1952. *Bedrossian, E. Howard, 4501 State Rd., Drexel Hill, Pa.
1935. Beerman, Hermann, 255 S. 17th St. (3)
1942. Behrend, Albert, Coventry House, Valley Rd. & Coventry Ave. (19126)
1945. Behrend, Bernard, 5910 Greene St. (44)
1934. *Behrend, Moses, Rittenhouse Claridge, 18th & Walnut Sts. (3)
1949. Beizer, Lawrence H., 419 South 19th St. (46)
1936. Bell, Benjamin Tertius, 1941 Woodland Rd., Abington, Pa.
1956. Beller, Martin Leonard, 1936 Spruce St. (3)
1947. Bellet, Samuel, 2021 Spruce St. (3)
1969. Belmont, Herman S., 249 N. Broad St. (19107)
1956. Bemont, Owen, 5723 No. Park Ave. (41)
1968. Benenson, Abram S., 1025 Walnut St. (19107)
1959. Berk, Nathaniel G., 2534 W. Cheltenham Ave. (50)
1951. Bernstine, J. Bernard, 255 S. 17th St. (3)
1965. Berry, Richard G., 1025 Walnut St. (19107)
1956. Berry, Theodore J., 300 E. Lancaster Ave., Wynnewood, Pa. (19096)
1967. Beyer, Karl H., Jr., Merck Sharp & Dohme Res. Labs., West Point, Pa. (19486)
1957. Biele, Albert M., 1530 Locust St. (19102)
1964. Biele, Flora H., 1530 Locust St. (19102)
1918. Billings, Arthur E., 2020 Spruce St. (3)
1957. Birdsall, Thomas M., 255 S. 17th St. (3)
1949. Bishop, Edward H., 811 Spruce St. (7)
1933. Bishop, Paul A., 1347 Waverly Rd., Gladwyne, Pa.
1944. *Blady, John V., Parkway House, 2201 Benjamin Franklin Pkwy. (30)
1960. Blake, Alton D., Jr., Bryn Mawr Medical Bldg., Bryn Mawr, Pa.
1952. Blake, Paul O., 273 N. Lansdowne Ave., Lansdowne, Pa.
1958. Blakemore, William S., 419 S. 19th St. (46)
1917. Block, Frank B., A1124 Park Drive Manor (44)
1963. Block, Reuben, 1555 Haddon Ave., Camden, N.J.
1949. *Blumstein, George I., 2039 Delancey St. (3)
1929. *Bockus, Henry L., 250 S. 18th St. (3)
1962. Boggs, Thomas R., Jr., Children's Hospital, 1740 Bainbridge St. (46)
1928. *Boles, Russell S., Rittenhouse Plaza, 1901 Walnut St. (3)
1961. Bongiovanni, Alfred M., 1740 Bainbridge St. (46)
1948. Bookhammer, Robert S., 264 Forrest Rd., Merion, Pa.
1931. Bortz, Edward Le Roy, Lankenau Medical Bldg. (19151)
1936. Bostwick, Delazon Swift, 1523 Sweetbriar Rd., P.O. Box 68, Gladwyne, Pa.
1947. Bourland, Henry S., 2219 Garret Rd., Drexel Hill, Pa.
1961. Bouzarth, William F., Episcopal Hospital (19125)
1961. Bove, Frank A., 2301 Pennsylvania Ave. (30)
1968. Bowen, Thales, Jr., Lankenau Hosp. (19151)
1954. Bowers, Paul A., 2031 Locust St. (3)
1942. Bowie, Morris A., Bryn Mawr Medical Bldg., Bryn Mawr, Pa.
1963. Boyer, Randal A., Holy Redeemer Hospital, Meadowbrook, Pa.
1964. Brackin, John T., Jr., Lansdale Clinic Bldg., S. Broad St. & Allentown Rd., Lansdale, Pa. (19446)
1965. Brady, Anna M., W. Queen Lane (19129)

* S. Weir Mitchell Associate

1959. Brady, Luther W., 230 N. Broad St. (19102)
1954. Bralow, S. Phillip, 3701 N. Broad St. (40)
1942. Branen, William T., Whitby & Cypress Aves., Yeadon, Pa.
1921. Bransfield, John W., 2031 Locust St. (3)
1948. Braun, William, 406 Cooper St., Camden, N.J. (08102)
1953. •Brav, Solomon S., 5575 N. Park Ave. (41)
1953. Breckenridge, Robert L., 414 Haddon Ave., Collingswood, N.J. (08108)
1964. Brenman, Arnold K., 3701 N. Broad St. (19140)
1966. Brent, Robert L., Jefferson Medical College (19107)
1961. Breslow, Irwin H., 1924 Panama St. (19103)
1946. •Briscoe, Clarence Conway, 811 Spruce St. (7)
1953. Brobeck, John R., Univ. of Pa. School of Medicine (4)
1958. Brody, Henry, Einstein Medical Center, York & Tabor Rds. (41)
1965. Brody, Jerome I., Graduate Hospital, 19th & Lombard Sts. (19146)
1952. Brody, Morris W., 2 W. Levering Mill Rd., Cynwyd, Pa. (19004)
1948. Brogan, Edmund J., 4601 Market St. (19139)
1958. Brooks, Frank P., Hospital of the Univ. of Pa. (4)
1936. •Brown, Clark E., Lancaster Ave. & City Line Ave. (19151)
1932. •Brown, Claude P., 1930 Chestnut St. (3)
1967. Brown, Clement R., Jr., Chestnut Hill Hospital (19118)
1963. Browne, Laurence T., Presidential Apts., D126 (19131)
1961. Brunt, Manly Y., 111 N. 49th St. (39)
1939. Brust, Raymond M., 301 Mill Rd., Havertown, Pa. (19083)
1969. Bryant, Winston M., Jr., 5900 Spruce St. (19139)
1953. Bucher, Robert M., 3401 N. Broad St. (40)
1961. Buerk, Minerva S., Bryn Mawr Medical Bldg., Bryn Mawr, Pa.
1962. •Burgoon, Carroll F., Jr., Skin & Cancer Hospital, 3322 N. Broad St. (19140)
1940. •Burnett, W. Emory, 3401 N. Broad St. (40)
1962. Burney, Leroy E., 3400 N. Broad St. (40)
1966. Burns, William P., 3400 Spruce St. (19104)
1954. Burros, Harry M., 419 S. 19th St. (46)
1968. Burrows, Stanley, Cooper Hosp., Camden, N.J. (08103)
1966. Burstein, Frank, 8541 Bustleton Ave. (19152)
1941. Butler, Miriam, Watersmeet, Glen Mills, Pa.
1957. •Butterworth, Thomas, 411 Walnut St., Reading, Pa.
1965. Byron, Harold J., Wyncote House, Wyncote, Pa.
1966. Cahn, Milton M., 1930 Chestnut St. (19103)
1957. Calhoun, John Alfred, Jr., 214 Elm Ave., Swarthmore, Pa.
1958. Cameron, Charles S., 235 N. 15th St. (2)
1962. Camishion, Rudolph C., Suite 303, Cooper Parkway West, N. Park Drive & Airport Highway, Pennsauken, N.J. (08109)
1952. Campbell, Edward W., Abington Memorial Hospital
1944. Campion, Richard J., Box 136, Springhouse, Ambler, Pa.
1964. Cancelmo, Jesse J., Jr., 337 W. Lancaster Ave., Wayne, Pa.
1967. Carabasi, Ralph A., 255 S. 17th St. (19103)
1935. Carey, Lawrence S., 2241 Garrett Road, Drexel Hill, Pa.
1930. Carpenter, Chapin, 502 Chestnut Lane, Wayne, Pa.
1959. Carrington, Elsie R., Woman's Medical College (29)
1960. Carroll, Robert T., 1015 Chestnut St., Jefferson Bldg., Room 803 (19107)
1917. Carson, John B., Newtown Square, Pa.
1956. Carty, James Byron, 51 Hampden Rd., Upper Darby, Pa.
1956. Casey, Paul R., 8350 Roosevelt Blvd. (19152)
1943. Castigliano, S. Gordon, Central & Shelmire Aves. (19111)
1949. Caswell, H. Taylor, 3401 N. Broad St. (40)
1954. Catenacci, Alfred J., 343 Winding Way, Merion Station, Pa.
1954. Cathcart, Richard T., Jefferson Hospital, 1025 Walnut St. (7)

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1950. *Chamberlain, Richard H., 3400 Spruce St. (4)
1939. Chamberlin, George W., Reading Hospital, Reading, Pa.
1967. Chambers, Richard A., 1025 Walnut St. (19107)
1966. Chamblin, William D., 3717 Chestnut St. (19104)
1945. Chance, Burton, Jr., 4400 Baltimore Ave. (19104)
1958. Channick, Bertram J., 3701 N. Broad St. (19140)
1954. *Charny, Charles W., 2039 Delancey Pl. (3)
1966. Chernoff, Benjamin, 6901 Old York Rd. (19126)
1969. Chesnick, Reuben B., 403 Cooper St., Camden, N.J. (08102)
1960. Chirico, Anna-Marie, Hosp. of Univ. of Pa. (4)
1966. Chisum, Melvin J., 245 N. Broad St. (19107)
1939. Ciccone, Emmet F., 2000 Willowbrook Rd., Huntingdon Valley, Pa. (19006)
1960. Cinquino, Mario A., 1518 S. Broad St. (46)
1960. Clader, Stanley C., 825-A Glenbrook Ave., Bryn Mawr, Pa.
1951. Clagett, A. Henry, Jr., 515 W. Eighteenth St., Wilmington, Del. (19802)
1966. Clark, Gerald R., Elwyn School, Elwyn, Pa. (19063)
1962. Clark, James E., Crozer-Chester Med. Center, 15th & Upland Ave., Upland, Chester, Pa. (19013)
1951. Clark, John K., Regional Med. Program, Rm. 2201, 3401 Market St. (19104)
1947. Clark, Thomas Williams, 218 W. Chestnut Hill Ave. (18)
1963. Cleveland, Albert F., 615 Morgan Ave., Drexel Hill, Pa.
1958. Closson, Edward W., 2320 S. Broad St. (45)
1949. Cohen, Louis B., 1320 Arrott St. (24)
1953. Cohen, Robert V., 520 Spring Ave., Elkins Park 17, Pa.
1967. Cohen, Sarle H., 1201 W. Olney Ave. (19141)
1965. Cohn, Edwin M., 1351 Tabor Rd. (19141)
1964. Cohn, Herbert E., 829 Spruce St. (19107)
1934. Collins, Leon Howard, Jr., 133 S. 36th St. (4)
1949. Conger, Kyril B., 3401 N. Broad St. (40)
1961. Coon, Julius M., 1025 Walnut St. (7)
1945. Coonel, Pauline, 47 E. Mt. Pleasant Ave. (19)
1930. *Cooper, David A., 1328 Medford Rd., Wynnewood, Pa. (19096)
1953. *Cooper, Donald R., Woman's Medical College, 330 Henry Ave. (29)
1960. Cooper, Edward Sawyer, 6710 Lincoln Drive (19)
1947. Coppolino, John F., 1807 S. Broad St. (45)
1952. *Corbit, John D., Jr., 3717 Chestnut St. (4)
1959. Cormeny, George F., 3818 Chestnut St. (4)
1965. Cornelison, Floyd S., Jr., 1025 Walnut St. (19107)
1941. Cornelius, Chalmers E., 119 Summit Ave., Jenkintown, Pa.
1911. Cornell, Walter S., Board of Public Education, Parkway and 21st St. (3)
1968. Cortes, Felix M., Temple Univ. Hosp. (19140)
1940. Cowan, Thomas H., 1930 Chestnut St. (3)
1967.**Cox, J. William, U.S. Naval Hospital (19145)
1966. Cram, Robert H., 918 County Line Rd., Bryn Mawr, Pa. (19010)
1947. *Crane, A. Reynolds, Pennsylvania Hospital (7)
1937. Crane, Martin P., 2435 Germantown Ave. (19133)
1952. Crellin, J. Antrim, 1930 Chestnut St. (3)
1968. Crichlow, Robert W., 3400 Spruce St. (19104)
1955. Crist, Walter A., 211 N. 5th St., Camden, N. J.
1968. Croll, Millard N., Hahnemann Hosp. (19102)
1959. Cullen, Milton L., 1936 Cottman Ave. (19111)
1962. Cunningham, John D., 3400 Spruce St. (4)
1934. Custer, R. Philip, 643 Moreno Road, Narberth, Pa.
1958. D'Alonzo, Walter A., 1647 S. 15th St. (45)
1938. Dannenberg, Arthur M., Sr., 235 S. 15th St. (2)

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* S. Weir Mitchell Associate
** Military service

1968. Daughtridge, Truman G., 8835 Germantown Ave. (19118)
1953. Davie, John H., 37 S. 20th St. (3)
1947. *Davis, S. Nelson, 524 Howe Rd., Merion Station, Pa.
1936. Davis, David M., 960 County Line Rd., Bryn Mawr, Pa. (19010)
1951. *Davis, J. Wallace, 135 18th St. (3)
1961. Dawber, Bryan A., Penn Mutual Life Insurance Co. (5)
1963. Day, H. James, Temple University Hospital (19140)
1935. *Deaver, J. Montgomery, Lankenau Medical Bldg. (19151)
1957. Decker, John Paul, Pennsylvania Hospital (7)
1957. Dees-Porch, Frances, Glendale Road & Chestnut Sts., Upper Darby, Pa.
1947. Dehne, Theodore L., Adams Avenue and Roosevelt Blvd. (24)
1958. Deitz, George W., III, 2240 Pine Rd., Huntingdon Valley, Pa.
1955. De Long, Samuel L., 234 E. College Ave., State College, Pa. (16801)
1952. DeLuca, Charles Q., 255 S. 17th St. (3)
1968. Denton, Robert, 816 Maloney Bldg., Univ. of Pa. Hospital (19104)
1952. De Orsay, Ralph H., 1241 Lindale Ave., Drexel Hill, Pa.
1951. *De Palma, Anthony F., 248 S. 21st St. (3)
1963. Derham, Robert J., McClatchy Bldg., Upper Darby, Pa.
1966. deRivas, Carmela F., Stanbridge & Sterigere Sts. Norristown, Pa.
1969. Desiderio, Vincent C., 2301 S. Broad St. (19148)
1959. DeTuerk, John J., 2301 S. Broad St. (19148)
1959. Dickens, Helen O., University of Pa. Hosp. (19104)
1968. Dickensheets, James G., 223 S. 6th St., Camden, N.J. (08103)
1958. Dickstein, Benjamin, 6810 Castor (24)
1956. Dietrich, Herbert James, Jr., Hospital of the University of Pennsylvania (4)
1952. Digilio, Victor A., 2200 St. James Place (17)
1963. DiMarino, Anthony J., 735 Delaware St., Paulsboro, N. J.
1960. Dinon, Louis R., 330 S. 9th St. (7)
1968. Di Palma, Joseph R., 235 N. 15th St. (19102)
1920. Doane, Joseph C., 5286 34th Ave., N., St. Petersburg, Fla. (33710)
1948. Dohan, Francis Curtis, 80 Princeton Road, Cynwyd, Pa.
1969. Dolphin, John M., 235 N. 15th St. (19102)
1954. Donaldson, James B., 3401 N. Broad St. (19140)
1946. Donnelly, Andrew J., Inst. for Cancer Research, 7701 Burholme Ave. (19111)
1967. Donnelly, Joseph C., Jr., Lankenau Medical Bldg. (19151)
1937. Donnelly, Robert T. M., 5205 N. Broad St. (41)
1962. Dorman, Philip J., 220 Sycamore Mills Rd., Media, Pa. (19063)
1967. Dougherty, Malvin J., 34 Copley Rd., Upper Darby Pa. (19082)
1964. Dratman, Mary B., Woman's Medical College, Henry Ave. & Abbottsford Road (19129)
1952. Drayer, Calvin S., 111 N. 49th St. (39)
1949. *Dripps, Robert D., 3400 Spruce St. (4)
1944. Dublin, George J., 1214 Cherry Hill Apts., Cherry Hill, N.J. (08039)
1935. Duncan, Garfield G., 330 S. 9th St. (7)
1966. Duncan, Theodore G., 330 S. Ninth St. (19107)
1953. Dupler, Donald A., 4028 Walnut St. (4)
1966. DuPree, Richard H., 414 Cooper St., Camden, N. J. (08102)
1942. *Durant, Thomas M., Einstein Medical Medical Center, N.D., York & Tabor Rds. (19141)
1942. Dyer, W. Wallace, Executive Director, The College of Physicians of Phil., 19 S. 22 St. (19103)
1962. D'Zmura, Thomas L., Presidential Apts., City Line Ave. & Presidential Blvd. (19131)
1969. Dzwonczyk, John, Jr., 5300 Cedar Ave. (19143)
1936. Easby, Mary Hoskins, R.D. 2, Shelburne, Vt. (05482)
1964. Eberlein, Walter R., 1740 Bainbridge St. (19146)
1966. Ehrlich, George E., Albert Einstein Medical Center, N.D. (19141)
1956. *Eiman, John W., Abington Memorial Hospital, Abington, Pa.
1962. Eisenberg, Samuel W., 3536 N. Broad St. (40)

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* S. Weir Mitchell Associate

1959. Eisenhower, James S. D., Jr., 2704 Pacific Ave., Wildwood, N, J.
1958. *Eisman, Sylvan H., 3600 Spruce St. (4)
1959. Elias, Elmer J., 10 Monticello Ave., Trenton, N. J.
1949. Elkinton, J. Russell, Oak Lane, Moylan, Pa.
1961. Elliott, Frank A., 807 Spruce St. (7)
1957. Ellis, Richard A., 255 S. 17th St. (3)
1955. Ellis, Samuel, 275 Bryn Mawr Ave., Bryn Mawr, Pa. (19010)
1939. Ellis, Van Mashburn, 1528 Spruce St. (2)
1928. Ellison, Richard T., Medical Office Bldg., 1245 Highland Ave., Abington, Pa. (19001)
1936. Ellson, J. Vernon, Glendale Road & Chestnut St., Upper Darby, Pa.
1937. *Elsom, Kendall A., Scott Paper Co. (13)
1932. Engel, Gilson C., Lankenau Medical Bldg. (19151)
1945. *English, O. Spurgeon, 449 Righters Mill Rd., Narberth, Pa.
1965. Epstein, Isadore S., 5219 Lebanon Ave. (19131)
1942. Erb, William H., 133 S. 36th St. (4)
1957. Erdman, William James, II, 3400 Spruce St. (4)
1965. Erslev, Allan J., 1015 Sansom St. (19107)
1957. Etzl, Michael M., 9025 Frankford Ave. (14)
1955. Eynon, Harold K., Route 70 at East Gate, Barclay Farm, Haddonfield, N. J.
1968. Faludi, Georgina, Hahnemann Hosp. (19102)
1946. Farell, David M., 1912 Spruce St. (3)
1903. Farr, Clifford B., Railroad Ave. & County Line Rd., Bryn Mawr, Pa.
1945. Farrar, George Elbert, Jr., 528 Scott Rd., Gladwyne, Pa.
1953. Farrell, Harry L., 1930 Chestnut St. (3)
1964. Faust, Herbert A., 245 N. Broad St. (19107)
1936. *Fetter, Ferdinand, 322 S. 21st St. (3)
1945. Fetter, John S., 1980 Country Club Dr., Huntingdon Valley, Pa. (19006)
1952. *Fields, Harry, 133 S. 36th St. (4)
1959. Fineberg, Charles, 255 S. 17th St. (3)
1955. Finestone, Albert J., 3701 North Broad St. (40)
1943. *Finkelstein, Arthur K., Graduate Hospital (46)
1955. Finkelstein, David, 419 S. 19th St. (46)
1955. *Finley, John K., 527 Welsh St., Chester, Pa.
1954. *Finn, Joseph L., 8014 Burholme Ave. (11)
1947. First, Arthur, 1714 Spruce St. (3)
1954. Fischer, Carl C., Penn Towers Apt. (19103)
1950. *Fischer, H. Keith, School Lane House, 5450 Wissahickon Ave. (19144)
1962. Fischer, George R., III, 801 Spruce St. (7)
1958. Fisher, Robert M., 118 Airdale Rd., Rosemont, Pa.
1956. Fite, Franklin K., Germantown Hospital (44)
1952. Fitts, William T., Jr., 3400 Spruce St. (4)
1952. Flexner, Louis B., 248 Anatomy-Chemistry Bldg., Univ. of Pa. (4)
1928. *Flick, John B., 819 Black Rock Rd., Gladwyne, Pa.
1957. Fornwalt, George R., 47 Copley Rd., Upper Darby, Pa.
1954. Forster, H. Walter, Jr., 37 S. 20th St. (3)
1960. Foulger, John H., 601 Rockwood Rd., Wilmington, Del. (2)
1941. Fox, C. Calvin, 1806 Spruce St. (3)
1963. Fox, Eva F., Woman's Medical College (19129)
1963. Frank, Paul E., York Road & Summit Ave., Hatboro, Pa.
1963. Frank, Robert L., 1282 Rydal Rd., Rydal, Pa. (19046)
1968. Frankl, William S., Springfield Hosp., 759 Chestnut St., Springfield, Mass. (01107)
1955. Frayer, William C., Franklin Med. Bldg., 829 Spruce St. (19107)
1941. Frazier, William Doane, 419 Gilpin Rd., Narberth, Pa.
1952. Freed, Herbert, 255 S. 17th St. (3)
1956. Freeman, Joseph T., 8-A Rittenhouse Plaza (3)
1963. Frieman, Henry D., 1500 Hellerman St. (49)

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* S. Weir Mitchell Associate

1958. Friewald, Milton J., 222 S. 19th St. (3)
1964. French, Gordon N., Univ. of Pa. Sch. of Medicine (19104)
1955. Friedenberg, Zachary B., 133 S. 36th St. (4)
1951. Friedman, Paul Sigmund, 1422 Chestnut St. (2)
1960. Friedman, Sidney, 1740 Bainbridge St. (46)
1958. Frisch, Frederick, 7 S. Dudley Ave., Ventnor City, N.J. (08046)
1937. Fritz, Herbert H., Pennswood Rd., Bryn Mawr, Pa.
1961. Frobese, Alfred S., Abington Memorial Hosp., Abington, Pa.
1953. Fruchter, Joseph M., The Philadelphian, 2401 Pennsylvania Ave. (19130)
1935. Fry, Wilfred Eyles, 1930 Chestnut St. (3)
1968. Fuchs, Morton, 1500 Vine St. (19102)
1963. Furgiuele, Francis P., 5430 Greene St. (19144)
1937. Furlong, Thomas F., Jr., Times Medical Building, Ardmore, Pa.
1967. Futcher, Palmer H., 3930 Chestnut St. (19104)
1964. Galligan, William J., 2909 Garrett Road, Drexel Hill, Pa.
1954. Gambescia, Joseph M., 1422 Race St. (2)
1969. Ganz, Michael A., 2118 Spring St. (19103)
1966. Garcia, Celso-Ramon, University Hospital (19104)
1969. Gardiner, George C., 5900 Spruce St. (19139)
1951. Garlichs, Richard W., 216 N. Manoa Road, Havertown, Pa.
1931. Garner, Vaughn C., 477 East Wadsworth St. (19)
1953. Garnet, James D., 807 Spruce St. (7)
1959. Gartland, John J., 269 S. 19th St. (3)
1950. Garvin, Eugene J., 533 S. 46th St. (43)
1958. Geckeler, George D., 22 W. Bells Mill Rd. (19118)
1952. Gefter, William I., Episcopal Hosp. (19125)
1969. Gehring, David A., Medical Arts Bldg., Suite 21, W. Red Bank Ave., Woodbury, N.J. (08096)
1935. Geist, Donald C., 510 Cynwyd Circle, Cynwyd, Pa. (19004)
1955. Gelfand, David, 1722 Pine St. (3)
1965. George, Thomas W., Jr., The Health & Welfare Bldg., 7th & Forster Sts., Harrisburg, Pa. (17102)
1941. •Gershon-Cohen, J., 255 S. 17th St. (3)
1959. Gerson, Irvin M., Cedarbrook Apts., Cedarbrook Hills, Wyncote, Pa. (19095)
1968. Gerstley, Louis, III, 2534 W. Cheltenham Ave. (19150)
1955. Gettes, Bernard C., 128 Overhill Rd., Cynwyd, Pa.
1963. Giambalvo, Giacchino P., 818 N. 63rd St. (19151)
1965. Gianakon, Harry G., 111 N. 49th St. (191139)
1934. •Gibbon, John H., Jr., 2103 N. Providence Rd., Media, Pa. (19063)
1939. •Gibson, Glen Gregory, 2031 Locust St. (3)
1944. Gifford, Edward S., Jr., 1913 Spruce St. (3)
1956. Gilbert, Philip D., Cooper Hospital, Camden, N. J.
1967. Gilbert, Robert P., 1025 Walnut St. (19107)
1947. Giletto, Basil J., 2020 Locust St. (3)
1955. Gill, Robert J., 801 Spruce St. (7)
1922. Gilmour, William R., 6616 Woodland Ave. (42)
1952. Gilpin, Sherman F., Jr., 1023 Beury Building, 3701 N. Broad St. (40)
1965. Ginley, Thomas H., Jr., Presidential Apts. (19131)
1949. Ginsburg, Isadore W., 3401 N. Broad St. (40)
1958. Girsh, Leonard S., 3701 N. Broad St. (40)
1954. Gislason, Gerhard J., 245 N. Broad St. (7)
1967. Glauser, Stanley C., 1709 Spruce St. (19103)
1964. Gloeckner, M. Louise C., 110 E. Fourth Ave., Conshohocken, Pa.
1956. Goldberg, Harry, 7913 Rolling Green Rd., Cheltenham, Pa.
1965. Goldburgh, Warren P., 1932 Spruce St. (19103)
1969. Goldman, Leonard I., Temple Univ. Hosp. (19140)

• S. Weir Mitchell Associate

1958. Golub, Leib J., 136 S. 16th St. (2)
1965. Goodman, David H., 6816 Castor Ave. (19149)
1956. Goracci, Armando F., Medical Arts Bldg., Woodbury, N. J. (08096)
1968. Gordon, Jacob S., 5119 N. Broad St. (19141)
1968. Gordon, Kenneth H., Jr., 1633 Montgomery Ave., Villanova, Pa. (19085)
1937. Gordon, William, 5345 Spruce St. (39)
1968. Gordy, Philip D., 1025 Walnut St. (19107)
1964. Gottlieb, Harry, 5603 Greene St. (19144)
1964. Gottlieb, Philip M., 818 Medical Arts Bldg., 16th & Walnut Sts. (19102)
1965. Gould, R. John, Delaware County Memorial Hospital, Drexel Hill, Pa.
1967. Gould, Robert A., 701 N. Pennsylvania Ave., Morrisville, Pa. (19067)
1956. *Gouley, Benjamin, 1201 W. Olney Ave. (19141)
1966. Gowen, George F., Misericordia Hospital (19143)
1957. Grahn, Henry Victor, 5132 Chester Ave. (43)
1966. Grant, B. David, 918 County Line Road, Bryn Mawr, Pa. (19010)
1965. Grassi, Michael O. A., 2038 Locust St. (19103)
1965. Greenbaum, Charles H., 6810 Castor Ave. (19149)
1940. Greene, Lloyd B., 326 S. 19 St. (19103)
1952. *Greening, Roy R., Dept. of Radiology, Lankenau Hosp. (19151)
1958. *Greenspan, Benjamin, 1319 W. Tabor Rd. (41)
1955. Greenstein, Raphael H., 1710 Pine St. (3)
1941. *Groff, Robert A., Suite 2306-08 Medical Tower, 255 S. 17 St. (19103)
1952. *Grotzinger, Paul J., 2121 Valley Rd., Huntingdon Valley, Pa.
1952. *Grove, D. Dwight, 5025 N. Marvine St. (19141)
1966. Guthrie, Marshall B., 1500 Spring Garden St. (19101)
1945. György, Paul, Philadelphia General Hospital (19104)
1935. Hadden, Samuel B., 135 S. 19th St. (19103)
1945. Hahn, George A., 255 S. 17th St. (3)
1967. Haines, Keith E., 300 S. Broadway, Camden, N.J. (08103)
1964. Hall, John H., 3401 N. Broad St. (19140)
1955. Hallahan, John D., 104 W. Front St., Media, Pa.
1951. Hallett, Joseph W., 136 S. 16th St. (2)
1961. Hammett, Van Buren O., 249 N. Broad St. (19107)
1967. Hammond, Jonathan A., 433 Bellevue Ave., Trenton, N.J. (08618)
1954. Hand, B. Marvin, 1801 Pennsylvania Blvd. (3)
1938. Hand, John G. 1724 Pine St. (3)
1964. Hanes, Robert B., 501 Long Lane, Upper Darby, Pa.
1947. Hanes, William James, 218 E. Beechtree Lane, Wayne, Pa.
1950. Hansen, A. Victor, 910 Centennial Rd., Penn Valley, Narberth, Pa. (19072)
1956. Harbert, Frederick, Jefferson Hospital (7)
1951. Harkins, Herbert P., 1930 Chestnut St. (3)
1966. Harner, Richard N., Graduate Hospital (19146)
1966. Harrington, Edwin D., Jefferson Medical College (19107)
1963. Harris, Charles, 5301 Old York Road (41)
1962. Harris, James R., 3222 W. Penn St. (19129)
1959. Harris, James S. C., Medical Office Bldg., 666 E. Penn St. (19144)
1948. Harris, T. N., 5112 Woodbine Ave. (31)
1929. Harrison, Francis G., 1900 Spruce St. (3)
1926. Hartmann, Fred I., 1914 Pine St. (3)
1961. Harvie, Fred H., 3400 Spruce St. (4)
1935. *Haskell, Benjamin F., 1427 Spruce St. (2)
1968. Haskin, Marvin E., 2461 N. 54th St. (19131)
1958. Haupt, George J., Lankenau Medical Bldg. (51)
1960. Hausman, David H., Pennsylvania Hospital, 8th & Spruce Sts. (7)
1947. Havens, Walter Paul, Jr., 139 Cheould Lane, Haverford, Pa.
1947. *Hawthorne, Herbert R., 3625 Darby Rd., Bryn Mawr, Pa. (19010)

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* S. Weir Mitchell Associate

1963. Hayes, Merrill B., 710 Madison St. Chester, Pa.
1952. Hayllar, Benjamin L., Bryn Mawr Med. Bldg., Bryn Mawr, Pa. (19010)
1961. Hayward, Malcolm L., 111 N. 49th St. (39)
1961. Heath, Frederick K., Merck Sharp and Dohme, West Point, Pa.
1964. Heath, Robert D., Lankenau Medical Bldg. (19151)
1957. Hedges, Thomas R., Jr., 330 South 9th St. (7)
1961. Heggestad, Gilman E., Conestoga Medical Bldg., Bryn Mawr, Pa.
1965. Heil, Charles G., Jr., The Benson East, Jenkintown, Pa. (19046)
1965. Heine, William I., 5579 N. Park Ave. (19141)
1967. Helwig, John, Jr., Germantown Hosp. (19144)
1944. Herbut, Peter A., Dept. of Pathology, Jefferson Medical College Hospital (7)
1954. Herron, James R., 1486 Haddon Ave., Camden 3, N. J.
1963. Hesch, Joseph A., Misericordia Hospital (19143)
1949. Heyl, W. Meredith, Medical Office Bldg., 666 E. Penn St. (19144)
1961. Hilferty, Daniel J., Jr., Sutton Terrace Apts., 50 Belmont Ave., Bala-Cynwyd, Pa.
1952. Hinkson, DeHaven, 329 N. 40th St. (4)
1962. Hinman, E. Harold, 1025 Walnut St. (7)
1924. Hirst, John C., 2d., 2016 Rittenhouse Sq. (19103)
1943. Hitschler, William J., Bethlehem Pike & Summit (18)
1944. Hneleski, Ignatius S., 802 S. 48th St. (43)
1943. Hockaday, Agnes, 316 Shadeland Ave., Drexel Hill, Pa.
1939. *Hodes, Philip J., Dept. of Radiology, Jefferson Medical College (7)
1947. *Hodges, John H., 1025 Walnut St. (7)
1963. Hoffman, Carl J., 2901 Cottman Ave. (19149)
1948. Hoffman, George L. Jr., 133 S. 36th St. (4)
1965. Holfelner, Edward D., Chestnut St. & Ashby Road, Upper Darby, Pa.
1964. Hollander, George, 3500 Vista St. (36)
1949. Hollander, Joseph L., 36th & Spruce Sts. (4)
1969. Hollander, Marc H., Univ. of Pa. Hosp. (19104)
1964. Hollinger, Herbert E., 3400 Spruce St. (19104)
1951. Hollis, Charles B., The Cambridge Apts. (19144)
1952. Holloway, Edward E., 1736 Pine St. (3)
1966. Holly, Roy G., 1025 Walnut St. (19107)
1966. Holter, F. Robert, 1911 Spruce St. (19103)
1968. Hope, John W., Children's Hosp. (19146)
1949. Hopkins, Henry U., Garden Court Plaza, 47th & Pine Sts. (43)
1953. Horan, Charles A., 734 N. 63rd St. (19151)
1946. Horan, Gerald W., Marple-Newton Medical Bldg., Newtown Square, Pa.
1947. *Horwitz, Orville, Hospital of the University of Pennsylvania (4)
1950. Houlihan, Carl T., 207 McClatchy Bldg., Upper Darby, Pa.
1944. Housel, Edmund L., 255 S. 17th St. (3)
1958. *Howard, John M., 230 N. Broad St. (2)
1964. Howland, Alvin Wilcox, School Lane House (44)
1946. Howson, John Yeatts, 115 Bloomingdale Ave., Wayne, Pa. (19087)
1951. Hubbard, John P., 3930 Chestnut St. (19104)
1947. *Huber, John Franklin, Temple University School of Medicine (40)
1937. Hughes, Joseph, 111 N. 49th St. (39)
1939. Hughes, P. Boland, 419 Hillbrook Rd., Bryn Mawr, Pa.
1968. Hume, H. Alan, 133 S. 36th St. (19104)
1968. Hummeler, Klaus, Children's Hosp. (19146)
1951. Hundley, J. Warren, 3818 Chestnut St. (4)
1954. Hunsicker, William C., Jr., 255 S. 17th St. (3)
1946. Hunt, William T., Jr., Suite 945, 1617 J. F. Kennedy Blvd. (19103)
1921. Hunter, Robert John, 928 N. 63rd St. (19151)
1967. Huth, Edward J., American College of Physicians, 4200 Pine St. (19104)
1952. Hyman, Harold L., 3401 N. Broad St. (40)

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* S. Weir Mitchell Associate

1950. *Imbriglia, Joseph E., 934 Cedar Grove, Wynnewood, Pa. (19096)
1949. Ingraham, Norman R., Jr., Stenton and Whitemarsh Aves. (18)
1957. Isaacson, Howard, Haverford Ave. & Drexel Rd. (19151)
1951. *Isard, Harold J., Albert Einstein Medical Center, York & Tabor Rds. (19141)
1951. *Israel, Harold L., 302 S. 19th St. (19103)
1947. *Israel, S. Leon, 807 Spruce St. (7)
1967. Jacoby, Jay J., 1025 Walnut St. (19107)
1967. Jaeger, Edward A., Media Clinic, Media, Pa. (19063)
1965. Jenkins, B. Wheeler, 1526 E. Upsal St. (19150)
1943. *Johnson, Julian, 3400 Spruce St. (4)
1959. Johnson, Robert G., 1015 Walnut St. (7)
1938. Johnson, Thomas A., 135 S. 18th St. (3)
1963. Jones, Robert E., 111 N. 49th St. (39)
1967. Jones, W. Mead, Somerset House, Fort Washington, Pa. (19034)
1963. Joseph, Rosaline R., 3401 N. Broad St. (40)
1966. *Joyce, John J., III, Medical Office Bldg., 666 E. Penn St. (19144)
1961. Joyner, Claude R., Jr., 3400 Spruce St. (4)
1957. Kacher, Leon, 2037 Pine St. (3)
1969. Kain, Thomas M., Jr., 403 Cooper St., Camden, N.J. (08102)
1957. Kane, Sydney H., 88 Valley Rd., Berkeley Heights, N.J. (07922)
1948. Kaplan, Louis, 2040 Pine St. (3)
1964. *Kaplan, S. Richard, 419 S. 19th St. (19146)
1938. Kasper, Kelvin A., 135 S. 18th St. (3)
1966. Kassay, Dezso, 1 Summit St. (19118)
1958. Kasser, Max D., 101 S. 20th St. (19103)
1945. Katz, G. Henry, 111 N. 49th St. (39)
1941. Kauffman, M. Luther, Medical Arts Bldg., Jenkintown, Pa.
1947. Kay, Calvin Frederick, Univ. of Pa. Hospital (4)
1954. Kaye, Robert, Children's Hospital, 1740 Bainbridge St. (46)
1968. Keates, Edwin U., 2385 Cheltenham Ave. (19150)
1947. Keefer, George Pfahler, 136 S. 16th St. (2)
1963. Keeley, Francis X., Professional Bldg., 1533 Haddon Ave., Camden, N.J.
1966. Keeney, Arthur H., Wills Eye Hospital (19130)
1949. Keiserman, Joseph, 1900 John F. Kennedy Blvd. (19103)
1959. Keitel, Hans G., USV Pharmaceutical Corp., 800 Second Ave., NYC (10017)
1965. Kellow, William F. T., 1025 Walnut St. (19107)
1932. *Kelly, Herbert T., 1830 Delancy Place (19103)
1961. Kelly, William E., 111 N. 49th St. (39)
1941. Kennedy, Patrick J., 32 Hampden Rd., Upper Darby, Pa.
1948. Kern, Franklin Moore, 903 Nicholson Rd., Wynnewood, Pa.
1921. *Kern, Richard A., Temple University Hospital, 3401 N. Broad St. (40)
1935. Keyes, Baldwin L., 2031 Locust St. (3)
1936. King, Orville C., 330 S. 9th St. (7)
1952. Kirschner, Jacob J., 1930 Chestnut St. (3)
1960. Kitchell, J. Roderick, Abington Hospital Medical Office Bldg., 1245 Highland Ave., Abington, Pa. (19001)
1920. Klein, Thomas, 191 Apts., Bala-Cynwyd, Pa. (19004)
1954. Kligman, Albert M., 36th & Spruce Sts. (4)
1934. Kline, Oram R., 896 Lake Ave., Woodbury Hts., N. J. (08097)
1959. Kline, Oram R., Jr., 406 Cooper St., Camden, N. J. (08102)
1948. Klingensmith, Paul O., Med. Science Bldg., Lankenau Hosp. (19151)
1958. Klingensmith, Walter C., 3600 Spruce St. (4)
1956. Klinghoffer, June F., Woman's Medical College (29)
1969. Klinghoffer, Leonard, 255 S. 17th St. (19103)
1960. Knopf, Carl L., 5312 Spruce St. (39)
1960. Knorr, John K., 3rd Lankenau Medical Bldg. (19151)

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* S. Weir Mitchell Associate

1959. Knowles, Harry J., 255 S. 17th St. (3)
1945. Kobler, H. B., School Lane House, 5450 Wissahickon Ave. (19144)
1959. Koiwai, Eichi Karl, 235 N. 15th St. (2)
1957. Koltes, John A., 530 Spring Lane (19128)
1936. Konzelmann, Frank Williamson, 27 W. Wilmont Ave., Somers Point, N. J. (08244)
1949. •Koop, C. Everett, 1740 Bainbridge St. (46)
1964. Koppel, Max M., 7310 Castor Ave. (19115)
1952. Kornblueh, Igiio H., Welsh Rd. & Verree Rd. (15)
1958. Kovach, Coleman W., 1830 Rittenhouse Sq. (19103)
1941. Krall, J. Thomas, 85 N. Landsdowne Ave., Landsdowne, Pa.
1948. Kramer, David W., 2007 Pine St. (3)
1954. •Krasnoff, Sidney O., Tabor Medical Bldg., York & Tabor Roads (41)
1952. Kravitz, Charles H., 626 Ashbourne Rd., Elkins Park, Pa.
1964. Kremens, Victor, 5601 N. Broad St. (19141)
1949. Kressler, Robert J., 330 S. 9th St. (7)
1968. Krishna, Narendra, 584 E. Chestnut St., Coatesville, Pa. (19320)
1947. Kuhlenbeck, Hartwig, Woman's Medical College, 3300 Henry Ave. (29)
1964. Kustrup, John F., 1418 S. Broad St., Trenton, N.J.
1967. Kyle, George C., 3400 Spruce St. (19104)
1947. La Boccetta, Alfred Charles, Philadelphia General Hospital, 34th St. & Curie Ave. (4)
1952. •Lachman, John W., 3401 N. Broad St. (40)
1950. Lamont, Austin, 3400 Spruce St. (4)
1946. Lampe, William T., 4207 Tyson Ave. (35)
1962. Landis, Harry P., Jr., 901 Columbia Ave., Palmyra, N.J.
1952. •Lang, Warren R., 1025 Walnut St. (19107)
1966. Langfitt, Thomas W., Pennsylvania Hospital (19107)
1941. Langner, Paul H., Jr., 1208 Edmonds Ave., Drexel Hill, Pa.
1945. Lansbury, John, 3414 Brae Bourn Drive, Huntingdon Valley, Pa. (19006)
1926. Laws, George M., 1907 Spruce St. (3)
1967. Lear, Walter J., Phila. General Hosp. (19104)
1950. Learner, Norman, 3701 N. Broad St. (40)
1920. Leavitt, Frederic Headley, 1527 Pine St. (2)
1941. Leberman, Paul R., Hospital of the University of Pennsylvania (4)
1957. Lee, Charles Trumbull, Jr., 33 E. Chestnut Hill Ave. (18)
1952. •Lehman, J. Stauffer, 230 N. Broad St. (2)
1961. Leibfried, Jane M., 5501 Green St. (44)
1951. Leivy, Frank E., Wm. Penn House, 1919 Chestnut St. (19103)
1944. Lell, William A., 333 S. 18th St. (3)
1935. Lemmon, William T., 133 S. 36th St. (4)
1965. Leopold, Howard C., 4623 York Rd. (19104)
1955. Leopold, Robert L., Univ. of Pa. Hosp. (19104)
1967. Leslie, W. Munroe, 8800 Germantown Ave. (19118)
1969. Leto, Francesco, 1419 S. Broad St. (19147)
1944. Lettiere, Anthony J., 425 E. State St., Trenton, N.J.
1965. Levenson, Carl, 619 Elkins Ave. (19117)
1933. Levering, J. Walter, Beaver Hill Apts., Jenkintown, Pa. (19046)
1959. Levick, Leonard J., 1335 Tabor Rd. (19141)
1958. Levine, Samuel, 7100 N. 19th St. (26)
1964. Levit, Edithe J., 3930 Chestnut St. (19104)
1964. Leit, Samuel M., 1910 Spruce St. (19103)
1958. LeWinn, Edward B., Upper Black Eddy, Pa. (18972)
1960. •Lewis, George C., Jr., 230 N. Broad St. (2)
1967. Lewis, Stuart H., 2050 W. Chester Ave., Havertown, Pa. (19083)
1964. Leymaster, Glen R., Woman's Medical College, 3300 Henry Ave. (19129)
1967. Liachowitz, Claire H., Graduate Hospital (19146)
1955. Lieberman, George E., 1900 Spruce St. (19103)

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1968. Lief, Harold I., 3828–30 Locust St. (19104)
1969. Lightfoot, William P., Temple Univ. Hosp. (19140)
1956. Likoff, William, 249 N. Broad St. (2)
1962. Lilley, George W., Scott Paper Co. (19113)
1940. Limberger, William A., 301 S. Church St., West Chester, Pa.
1948. Lin, David Y. P., 2222 S. Broad St. (45)
1966. Lin, Paul M., The Benson, Suite 123, Jenkintown, Pa. (19046)
1938. Lindauer, M. August, 133 S. 36th St. (4)
1956. Linquist, John N., 422 Sabine Ave., Wynnewood, Pa.
1927. Lindsey, Walter H., 102 Park Drive, Highland Park, Doylestown, Pa.
1936. Lintgen, Charles, 1930 Chestnut St. (3)
1958. Lipshutz, Arthur, 7974 Fayette St. (19)
1959. *Lipshutz, Herbert, 807 Spruce St. (19107)
1953. Lipsius, Edward I., 319 S. 16th St. (3)
1959. Little, Ralph B., 111 N. 49th St. (39)
1944. Livesey, Mary M., 8835 Germantown Ave. (19118)
1936. Llewellyn, Thomas H., 910 N. 63rd St. (19151)
1907. Lodholz, Edward, The Fairfax, 43rd & Locust Sts. (4)
1933. Long, Esmond R., Society Hill Towers, 23B, 220 Locust St. (19106)
1951. Long, Joseph P., 1930 Chestnut St. (3)
1935. Long, William L., 2038 Locust St. (3)
1931. Longaker, Edwin P., 41 E. Montgomery Ave., Ardmore, Pa.
1951. Lohber, Stanley H., Temple Univ. Hospital, 3401 N. Broad St. (19140)
1961. Lorry, Ralph W., 1247 E. Luzerne St. (24)
1960. Lovett, B. Frank, North Park Drive & Airport Highway, Pennsauken, N.J. (08109)
1963. Lubowitz, Richard M., Benson East Apts., Jenkintown, Pa.
1936. Lucchesi, Pascal Francis, 601 E. Gorgas Lane (19)
1967. Luce, Cyril M., 37 S. 20th St. (19103)
1960. Lucine, Albert A., 345 S. 19th St. (3)
1939. Luongo, Romeo A., 2054 Locust St. (3)
1951. Lusombe, Herbert A., 136 S. 16th St. (2)
1952. Lutman, Frank C., 33 E. Chestnut Hill Ave. (19118)
1919. Lynch, Frank B., Jr., 809 Cambridge Apts., School House Lane (44)
1950. Lynch, J. Edward, Suite 305, Wynnewood House, 300 E. Lancaster Ave., Wynnewood, Pa.
1953. Lyons, John W., 255 S. 17th St. (3)
1965. McCabe, James L., Jr., Barclay Bldg., One Belmont Ave., Bala-Cynwyd, Pa.
1932. *McCahey, James F., Wesley Manor, Jacksonville, Fla. (32223)
1958. *McClenahan, John L., 39 East Chestnut Hill Ave. (18)
1935. McClenahan, William U., 33 East Chestnut Hill Ave., Chestnut Hill (18)
1957. McConnell, Edward L., Jr., 2342 S. Broad St. (45)
1934. McCouch, Grayson P., Univ. of Pa. School of Medicine (4)
1962. McCracken, Stewart, 3701 N. Broad St. (40)
1938. McCrea, Lowrain E., 1930 Chestnut St. (3)
1958. McCune, Wallace G., 5555 Wissahickon Ave. (44)
1942. McDonald, P. Robb, Langenau Medical Bldg. (19151)
1953. McDonnell, William V., West Jersey Hospital, Camden 4, N. J.
1952. McElroy, Robert C., 133 S. 36th St. (4)
1950. McFadden, William M., 1187 E. Washington Lane (19138)
1949. McGavic, John S., 1104 Montgomery Ave., Rosemont, Pa. (19010)
1945. McGee, Lemuel Clyde, Hercules Powder Company, Wilmington, Del.
1954. McGhee, Edward H., 33 E. Chestnut Hill Ave. (18)
1952. McGlade, Thomas H., 514 Cooper St. Camden, N.J. (08102)
1966. McGowan, Larry, Fitzgerald Mercy Hospital, Darby, Pa. (19023)
1966. McGrath, Raymond J., 1720 Spruce St. (3)
1959. McKeown, John J., Jr., 255 S. 17th St. (19103)

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1933. McLaughlin, James S., 330 S. 9th St. (19107)
1966. McMichael, Harrison, 524 Meadowbrook Circle, Wayne, Pa. (19087)
1924. McMillan, Thomas M., 2451 Mt. Island Drive, North, Mobile, Ala. (36606)
1924. McPhedran, F. Maurice, Cope House, Awbury, Arboretum (19138)
1955. McStravog, Lawrence J., 6910 Market St., Upper Darby, Pa.
1954. MacFayden, Bruce V., 1819 Pennsylvania Blvd. (3)
1932. •Macfarlane, Catherine, 5808 Greene St. (19144)
1964. Macht, Elmer L., Jr., York & Keith Roads, Abington, Pa.
1949. MacNeal, Perry Scott, Suite 308, Franklin Medical Bldg., 829 Spruce St. (19107)
1951. MacNeish, W. J., 821 Great Springs Rd., Rosemont, Pa. (19010)
1955. Macy, Dorothy, 5616 N. 45 St., Phoenix, Ariz. (85018)
1957. Madow, Leo, Woman's Medical College, 3300 Henry Ave. (19129)
1966. Maguire, Henry C., Jr., Hahnemann Medical College & Hosp. (19102)
1952. Mahoney, J. Francis, 250 S. 18th St. (3)
1969. Mallin, Aaron W., Rittenhouse Med. Center, 1900 Spruce St. (19103)
1965. Mancall, Elliott L., 230 N. Broad St. (19102)
1959. Mandel, Martin M., Benson Manor, Township Line & Washington Lane, Jenkintown, Pa.
1968. Mandell, Morton S., 1319 W. Tabor Rd. (19141)
1966. Manges, W. Bosley, 255 S. 17th St. (19103)
1954. Manges, Willis E., Methodist Hospital, Broad & Wolf Sts. (48)
1949. Manlove, Francis R., 500 Williamson Rd., Gladwyne, Pa.
1960. Manning, Valentine R., 3336 Aldine St. (36)
1956. Manstein, George, 1351 Tabor Rd. (41)
1969. Mansure, Patricia R., The Parkway at Fairmont Ave. (19101)
1961. Mapow, Abraham B., 535 Pine St. (6)
1953. Marbach, A. Herbert, 1307 Tabor Rd. (41)
1948. Marden, Philip Ayer, University Hospital, 36th & Spruce Sts. (4)
1958. Marino, Daniel J., 422 East 22nd St., Chester, Pa.
1966. Markind, Simon, Albert Einstein Med. Center, York & Tabor Rds. (19141)
1969. Marks, Gerald, 255 S. 17th St. (19103)
1950. Marshall, E. Wayne, 907 Pine St. (19107)
1968. Martin, John H., 3401 N. Broad St. (19140)
1951. •Martin, William L., 402 Holly Lane, Wynnewood, Pa. (19096)
1953. Marx, Halvey E., 76 Brennan Drive, Bryn Mawr, Pa.
1966. Mastroianni, Luigi, Jr., University Hospital (19104)
1968. Mausner, Judith S., Woman's Medical College (19129)
1939. •May, Hans, 244 S. 17th St. (3)
1951. Mayock, Robert L., 3600 Spruce St. (4)
1958. Mays, Ralph Whiteman, 154 W. Tulpehocken St. (44)
1961. Mechanick, Philip, Univ. of Pa. Hosp. (19104)
1952. Mecray, Paul, Jr., Suite 303, Cooper Parkway W., N. Park Drive & Airport Highway, Pennsauken, N.J. (08109)
1951. Medinger, Frederick G., 1941 Woodland Road, Abington, Pa.
1959. Medoff, Joseph, 5400 Wynnefield Ave. (31)
1941. Mendell, Theodore H., 2023 Spruce St. (3)
1943. Meranze, David R., 229 W. Upsal St. (19119)
1954. Mertens-Roesler, Elizabeth, 2910 Woodpipe Lane (29)
1956. Merves, Louis, 1015 Chestnut St. (7)
1955. Mervine, Thomas B., Medical Arts Bldg., Woodbury, N. J. (08096)
1959. Metzger, Harry N., 1815 Pine St. (3)
1964. Meyer, Edward C., Fitzgerald Mercy Hospital, Darby, Pa. (19023)
1955. Meyer, Eugene A., 1438 Mt. Ephraim Ave., Camden, N. J.
1964. Michaile, Kenneth I., 1930 Chestnut St. (19103)
1956. Miller, Bernard Joseph, 6013 Greene St. (44)
1939. Miller, Malcolm W., Lankenau Medical Bldg. (19151)

• S. Weir Mitchell Associate

1939. *Miller, Merle M., 6013 Greene St. (44)
1921. *Miller, T. Grier, 133 S. 36th St. (4)
1955. Miller, William H., Fitzgerald Mercy Hospital, Darby, Pa.
1952. Mineiiart, John R., 615 E. Allegheny Ave. (19134)
1952. *Mintz, S. S., 1930 Chestnut St. (3)
1963. Mishkin, Mark M., Univ. of Pa. Hospital (19104)
1950. Mitchell, John McK., 6 Bryn Mawr Ave., Bryn Mawr, Pa. (19010)
1952. Mitchell, Robert McNair, 807 Spruce St. (7)
1959. Mitterling, Robert C., Chestnut St. & Glendale Rd., Upper Darby, Pa.
1967. Monheit, Richard S., Albert Einstein Medical Center, N.D. (19141)
1936. Montgomery, Hugh, 932 Merion Sq. Rd., Gladwyne, Pa. (19035)
1936. *Montgomery, John B., 1930 Chestnut St. (3)
1932. Montgomery, Thaddeus L., 2031 Locust St. (3)
1935. *Moore, John Royal, 3401 N. Broad St. (40)
1947. Moore, Matthew Thibaud, 1813 Delancey Pl. (3)
1958. Moore, Samuel R., Jr., 1600 Arch St. (1)
1958. Moran, Alma D., 3665 Midvale Ave. (29)
1936. Morgan, David R., 218 W. Mt. Carmel Ave., Glenside, Pa.
1944. Morris, Harold H., St. Clair Drive, St. Simons Island, Georgia (31522)
1945. Morris, I. Paul, 1939 Cheltenham Ave. (17)
1969. Morris, Robert G., Jr., 5000 Woodland Ave. (19143)
1967. Moss, N. Henry, N. Medical Bldg., 1335–49 W. Tabor Rd. (19141)
1964. Most, William, 994 Haddon Ave. Collingswood 7, N. J.
1959. Moyer, John H., 230 N. Broad St. (2)
1941. *Muckle, Craig Wright, 8016 Seminole Ave. (19118)
1929. Mudd, Stuart, V. A. Hosp. (19104)
1960. Mulberger, Robert D., 1930 Chestnut St. (3)
1965. Muller, Otto, Fitzgerald-Mercy Hospital, Darby, Pa.
1968. Murphey, Henry S., Henry R. Landis Hosp., Girard and Corinthiam Aves. (19130)
1930. Murphy, Douglas P., 601 S. Bowman Ave., Merion Station, Pa.
1953. Murphy, Edward J., Bryn Mawr Medical Bldg., Bryn Mawr, Pa.
1958. Murphy, John J., 3600 Spruce St. (4)
1959. Murray, Edwin N., 130 N. Broadway, Camden, N. J.
1955. Murtagh, Frederick, Jr., 3401 N. Broad St. (40)
1951. Myers, David, 3701 N. Broad St. (40)
1965. Myers, Richard N., 307 Langenau Medical Bldg. (19151)
1955. Nachod, Grace R., 5501 Greene St. (44)
1968. Naden, Randall S., Jr., 130 N. Broadway, Camden, N.J. (08102)
1968. Nagel, Frank O., Jr., 37 S. 20th St. (19103)
1945. Naide, Meyer, 2034 Spruce St. (3)
1951. Naidoff, David, 3500 Tudor St. (36)
1966. Nance, Maurice R., 1500 Spring Garden St. (19101)
1950. Nardone, Anthony A., 912 S. 49th St. (43)
1959. Neal, Hunter, S., 460 Langenau Medical Bldg., (19151)
1958. Nealon, Thomas F., Jr., St. Vincent's Hosp., 170 W. 12th St. N.Y.C. (10011)
1963. Nelson, Arthur D., 3400 N. Broad St. (40)
1943. Nelson, Waldo E., 615 Moreno Rd., Narberth, Pa.
1955. *Nemir, Paul, Jr., 19th & Lombard Sts. (19146)
1935. *Nicholson, Jesse Thompson, 1740 Bainbridge St. (19146)
1960. Nicholson, John W., III, 115 Chestnut St., Moorestown, N. J.
1947. Noone, Ernest L., R. D. #1, Elverson, Chester Co., Pa. (19520)
1954. Norris, Charles M., 3401 N. Broad St. (40)
1938. *Norris, Robert F., 430 Colebrook Lane, Bryn Mawr, Pa. (19010)
1957. Oakey, Richard S., Jr., Suite 218, Lankenau Med. Bldg. (19151)
1963. O'Hara, A. Edward, Jefferson Medical College Hospital (19107)
1954. Olsen, Axel K., The Windsor Apts. (19103)

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* S. Weir Mitchell Associate

1949. O'Neill, James F., 1425 Woodland Rd., Rydal, Pa. (19046)
1947. Ornsteen, A. M., 2007 Delancey Pl. (3)
1955. Ottenberg, Donald J., Eagleville Hosp., Eagleville, Pa. (19408)
1968. Ovedoff, David L., 1500 Spring Garden St. (19101)
1961. Owen, Barbara J., Bryn Mawr Hospital, Bryn Mawr, Pa. (19010)
1949. *Padis, Nicholas, Lankenau Medical Bldg. (51)
1968. Padula, Richard T., 1025 Walnut St. (19107)
1968. Pareira, Morton D., Albert Einstein Med. Center (N), York & Tabor Rds. (19141)
1963. Parish, Benjamin D., Jr., 1261 Bethlehem Pike, Flourtown, Pa. (19031)
1945. Park, Felix Roman, 1980 Utica Sq., Tulsa, Okla. (74114)
1940. Parker, Alan P., Bryn Mawr Medical Bldg., Bryn Mawr, Pa. (19010)
1948. Parkhurst, Leonard Woods, 330 S. 9th St. (7)
1952. Paxton, Newlin F., 245 N. Broad St. (7)
1932. Payne, Franklin L., Univ. of Pa. Hospital (4)
1965. Pearlstine, Beatrice, 7404 Mountain Ave. (19126)
1954. Pearce, Alexander E., 1420 Race St. (2)
1958. Pearce, Rowan C., Jr., 327 Cooper St., Camden 2, N. J.
1943. Pearson, Gerald H. J., Presidential Apts.—Adams House (31)
1954. Pearson, Manuel M., 111 N. 49th St. (39)
1967. Pechin, Sergius P., 1910 Garrett Rd., Lansdowne, Pa. (19050)
1960. Peltz, William L., 111 N. 49th St. (39)
1930. *Pendergrass, Eugene P., Radiology Dept., University Hospital, 3400 Spruce St. (19104)
1953. Penneys, Raymond, University of Pennsylvania Hospital (4)
1964. Perrin, George M., First Floor Mills Bldg., Philadelphia General Hospital, 34th & Curie Ave. (19104)
1940. Pessl, Johannes F., 224 West State St., Trenton, N. J. (08608)
1952. Peters, Michael, Fairhill Rd., Hatfield, Pa. (19440)
1968. Peterson, Arthur L., 111 N. 49th St. (19139)
1961. Peterson, Lysle H., Bockus Research Institute, 19th & Lombard Sts. (19146)
1940. Pettit, Horace, 601 Suburban Sq. Bldg., Ardmore Pa. (19003)
1949. *Pettit, Mary DeWitt, 3343 W. Penn St. (29)
1946. Pfeiffer, Mildred C. J., 358 Valley Rd., Merion, Pa. (19066)
1935. Phillips, Arthur W., 3904 Walnut St. (19104)
1961. Phillips, William A., Eastern Pennsylvania Psychiatric Institute (19129)
1948. Pierson, Daniel B., Jr., 740 Beacon Lane, Merion, Pa. (19066)
1964. Pierucci, Louis, Jr., 1025 Walnut St. (19107)
1961. Pike, Anne H., 5603 Greene St. (19144)
1957. *Pilling, George Platt, IV, 2600 N. Lawrence St. (19133)
1933. *Pillsbury, Donald M., Duhring Labs., University Hospital (19104)
1957. Platt, Ruth M., 441 Lyceum Ave. (28)
1951. Poinsard, Paul J., 2031 Locust St. (3)
1968. Polin, Edward B., 7810 Old York Rd. (19117)
1937. Polk, David Stewart, Rosemont, Pa.
1967. Polk, Lewis D., 500 S. Broad St. (19146)
1956. *Pontarelli, Domenic J., 1037 Great Springs Rd., Rosemont, Pa.
1953. Porreca, George A., 1843 S. Broad St. (19148)
1932. Porter, Roland De Lance, Abington Medical Bldg., Abington, Pa.
1951. Post, Joseph W., 105 Glenview Ave., Wyncote, Pa. (19095)
1951. Pote, Harry H., 103 E. Ridley Ave., Ridley Park, Pa.
1958. Potter, H. Phelps, Jr., Woman's Medical College (19129)
1951. *Pressman, Robert S., 170 W. Olney Ave. (19120)
1965. Price, Joseph J., 36 Copley Road, Upper Darby, Pa.
1947. Prickett, John A., Warrington, Bucks County, Pa.
1954. Prince, Leon N., 2025 Spruce St. (3)
1931. Pryor, Charles Allen, 734 S. Latch's Lane, Merion Station, Pa. (19066)
1952. Pugh, James E., 614 Church Lane, Yeadon, Pa.

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* S. Weir Mitchell Associate

1968. Qualls, Donald M., Lankenau Medical Bldg. (19151)
1943. *Radbill, Samuel X, 7043 Elmwood Ave. (42)
1953. Radbill, Sidney G., Wm. Penn House, 1919 Chestnut St. (19103)
1966. Raffensperger, Bruce W., 8811 Germantown Ave. (19118)
1953. Raffensperger, Edward C., 260 St. James Place (6)
1945. Rakoff, Abraham Edward, Franklin Medical Bldg., 829 Spruce St. (19107)
1953. Ralston, Edgar L., 3400 Spruce St. (4)
1931. Ramsey, Frank M., 620 E. Willow Grove Ave. (18)
1968. Randall, Peter, Univ. of Pa. Hosp. (19104)
1953. Ranieri, Tito A., 2320 S. Broad St. (45)
1941. Rankin, Charles A., Ludlow & Heather Rd., Upper Darby, Pa.
1968. Rashkind, William L., Children's Hosp. (19146)
1951. *Rathmell, Thomas K., 446 Bellevue Ave., Trenton, N. J.
1926. *Ravdin, I. S., Univ. of Pa. Hospital (4)
1956. Ravdin, Robert Glenn, 3400 Spruce St. (4)
1959. Raventos, Antolin, 3400 Spruce St. (4)
1962. Raymond, F. Douglas, Jr., Bryn Mawr Medical Bldg., Bryn Mawr, Pa.
1964. Raymond, Samuel, 711 Maloney Bldg., University Hospital, 36th & Spruce Sts. (19104)
1961. Read, William T., Jr., 110 Munn Lane, Cherry Hill, N. J. (08034)
1954. *Reagan, Lindley B., 166 Madison Ave., Mt. Holly, N. J. (08060)
1965. Reddy, John B., 1025 Walnut St. (19107)
1960. Reed, Theodore P., Lankenau Medical Bldg. (19151)
1928. Reese, Warren S., 2118 Locust St. (3)
1964. Reinhard, John J., Jr., 335 Woodstown Road, Salem, N. J.
1956. Reishtein, William A., 16 Bancoyd Rd., Merion Station, Pa.
1963. Reisinger, Paul B., 855 Berkeley Ave., Trenton, N. J.
1951. Rentschler, Laurence B., 5800 Ridge Ave. (28)
1968. Rex, Eugene B., Lankenau Medical Bldg. (19151)
1945. *Rhoads, Jonathan E., Univ. of Pa. Hospital (4)
1946. Rhoads, Rebecca M. P., Alden Park, Kenilworth 303 (19144)
1963. Rial, William Y., 111 Dartmouth Ave., Swarthmore, Pa.
1936. Ritter, Joseph A., 1034 Bryn Mawr Ave., Narberth, Pa.
1932. Robbins, Frederick R., 317 Milbank Rd., Bryn Mawr, Pa.
1952. Robbins, Robert, 3401 N. Broad St. (40)
1954. *Roberts, Brooke, 3400 Spruce St. (4)
1957. Roberts, Joan Mary, 4 W. Mt. Pleasant Ave. (19)
1968. Roberts, John M., 5555 Wissahickon Ave. (19144)
1964. Robinson, James H., 5900 Spruce St. (19139)
1969. Robinson, Nathaniel M., 5229 Spruce St. (19139)
1969. Rodgers, Robert A., Jr., Route 45 & Griscom Lane
1960. Roeders, Paul H., 330 S. 9th St. (7)
1955. *Rogers, Fred B., 3401 N. Broad St. (40)
1951. *Ronis, Bernard J., 2106 Spruce St. (3)
1948. Roscoe, Constantine R., 7226 Castor Ave. (24)
1928. Rose, Edward, 426 Owen Rd., Wynnewood, Pa.
1936. Rose, Elizabeth Kirk, 426 Owen Rd., Wynnewood, Pa.
1959. Rose, Isadore, 6000 W. Oxford St. (19151)
1965. Rosenberg, Hyman, 1555 Haddon Ave., Camden, N. J.
1966. Rosenberg, Morton, 1025 Walnut St. (19107)
1946. *Rosemond, George Parrott, 3401 N. Broad St. (40)
1960. Rosenow, Edward C., Jr., American College of Physicians, 4200 Pine St. (4)
1948. Rothman, Maurice M., 2201 Pennsylvania Ave. (19130)
1951. Rouse, George P., Jr., 2031 Locust St. (19103)
1966. Rover, Harold, 1427 Spruce St. (19102)
1952. Roxby, Bruce S., 5501 Greene St. (44)
1955. Roxby, John B., Jr., 4821 Germantown Ave. (44)

* S. Weir Mitchell Associate

1949. Royster, Henry P., 3400 Spruce St. (4)
1959. Rubin, Alan, 255 S. 17th St. (3)
1952. Rubin, I. Edward, 255 S. 17th St. (3)
1966. Rugart, Karl F., 811 Spruce St. (19107)
1946. Rupp, Charles, 133 S. 36th St. (4)
1947. Rush, Alexander, 330 S. 9th St. (7)
1963. Rutter, William A., 425 Wister Rd., Wynnewood, Pa.
1963. Ryan, James J., Suite 2, 7516 City Line Ave. (19151)
1945. Rynes, Samuel E., 334 S. 21st St. (3)
1965. Sachs, Marvin L., 133 S. 36th St. (19104)
1952. Sain, Fletcher D., 1245 Highland Ave., Abington, Pa. (19001)
1958. Sall, Manuel, 255 S. 17th St. (3)
1952. Salner, Nathan P., 6812 Castor Ave. (24)
1952. Saltzman, Maurice, 2037 Spruce St. (3)
1966. Samitz, M. H., 1715 Pine St. (19103)
1944. Sampson, David Alan, 726 Braeburn Lane, Penn Valley, Narberth, Pa.
1964. Santangelo, Samuel C., 1941 Woodland Road, Abington, Pa.
1968. Sarin, Lov K., Lankenau Med. Bldg. (19151)
1950. Sarner, Joseph B., 289 Locust St. (19106)
1967. Sattilaro, Anthony J., Methodist Hospital (19148)
1954. Savacool, J. Woodrow, 146 W. Tulpehocken St. (44)
1947. Sayen, John J., 3600 Spruce St. (4)
1948. Scarano, Joseph Albert, 1432 S. Broad St. (19146)
1969. Schaedler, Russell W., Jefferson Med. College (19107)
1917. *Schaeffer, J. Parsons, 4634 Spruce St. (19139)
1929. *Scheffey, Lewis C., 601 Walnut Lane, Haverford, Pa. (19041)
1942. *Scheie, Harold G., 3400 Spruce St. (19104)
1929. Schenck, Harry P., 1235 Wyngate Rd., Wynnewood, Pa. (19096)
1966. Schless, Guy L., 330 South Ninth St. (19107)
1945. Schlezinger, Nathan S., 255 S. 17th St. (3)
1961. Schlosser, Woodrow D., 3701 N. Broad St. (40)
1917. Schnabel, Truman G., 509 Williams Road, Wynnewood, Pa. (19096)
1958. Schnabel, Truman G., Jr., Phila. General Hospital (19104)
1957. Schnall, Nathan, 2037 Pine St. (3)
1962. Schneider, Henry C., 4801 Penn St. (24)
1966. Schoenberg, Harry W., 3400 Spruce St. (19104)
1968. Schotz, Seymour, 51 N. 39th St. (19104)
1955. Schreder, Charles J., 318 W. Godfrey Ave. (20)
1952. Schulz, Norbert J., 1901 Walnut St. (3)
1950. Schumann, Francis, 8811 Germantown Ave. (18)
1948. Schwarz, Gabriel A., 133 S. 36th St. (4)
1962. Schwarz, Henry P., Philadelphia General Hospital (4)
1955. Schwegman, Cletus W., Hospital of the University of Penna. (4)
1966. Scott, J. Clifford, 826 Maple Ave., Berwyn, Pa.
1930. Scott, John Porter, Children's Hospital, 1740 Bainbridge St. (46)
1950. Scott, Michael, 3401 N. Broad St. (40)
1940. Scott, T. F. McNair, Children's Hospital, 1740 Bainbridge St. (46)
1952. Seifer, Arthur F., 710 South Main St., Phoenixville, Pa.
1958. Sellers, Alfred M., Hosp. of the Univ. of Pa. (4)
1952. Semisch, Charles W., III, 1344 Gilbert Rd., Meadowbrook, Pa.
1968. Senior, John R., PGH, 34th and Curie Ave. (19104)
1969. Sewell, Edward M., Children's Hosp. (19146)
1967. Seyler, Raymond Q., 1600 Arch St. (19101)
1966. Shaffer, Horace M., 208 W. State St., Trenton, N. J. (08608)
1960. *Shannon, Gerard M., 8118 Bustleton Ave. (15)
1963. Sharples, Wynne, 454 S. Ithan Ave., Villanova, Pa. (19085)

* S. Weir Mitchell Associate

1928. Sharpless, Frederick C., 621 Railroad Ave., Haverford, Pa.
1956. Shaw, Daniel L., Jr., 702 Knox Rd., Villanova, Pa.
1963. *Shearburn, Edwin W., 306 Lankenau Medical Bldg. (19151)
1955. Schechter, Fred R., 2461 No. 54th St. (31)
1954. Shelly, Walter B., 36th & Spruce Sts. (4)
1955. Shenkin, Henry A., Episcopal Hospital (25)
1946. Shepherd, Samuel Garfield, 1900 Spruce St. (19103)
1968. Sherk, Henry H., 330 S. Ninth St. (19107)
1968. Sherry, Sol, Temple Univ. Health Center (19140)
1956. Sherson, Jacob S., 405 Meadow Lane, Merion Station, Pa. (19066)
1964. Shimkin, Michael B., Temple University School of Medicine (19140)
1958. Shipps, Hammell P., 21 E. Euclid Ave., Haddonfield, N. J. (08033)
1957. Shope, Edward Pierce Lentz, 807 Wilson Bldg., Camden, N. J.
1946. Shoup, George Daniel, 121 W. Walnut Lane (44)
1955. *Shubin, Harry, 6601 N. 21st St. (38)
1952. Shuman, Charles R., 3401 N. Broad St. (40)
1949. Sidlick, David M., Park Towne Place E., 2200 Benj. Franklin Pkwy. (19130)
1969. Silberberg, Donald H., Univ. of Pa. Hosp. (19104)
1941. *Silcox, Louis E., Lankenau Medical Bldg. (19151)
1956. *Sillars, Charles H., Abington Memorial Hospital, Abington, Pa.
1968. Silverio, John, Wyeth Labs., P. O. Box 8299 (19101)
1963. Silverman, Daniel, 269 South 19th St. (19103)
1955. Silverstein, Alexander, 2114 Pine St. (3)
1967. Simenhoff, Michael L., 1205 Walnut St. (19107)
1966. Simkins, Samuel, 515 W. Godfrey Ave. (19126)
1961. Simmons, Vaughan P., The Fidelity Mutual Life Insurance Co. (1)
1954. Singmaster, Lawrence, 272 Cheswold Lane, Haverford, Pa.
1952. Skromak, Stanley J., 5108 Torresdale Ave. (24)
1968. Slate, William G., Albert Einstein Med. Center (N), York and Tabor Rds. (19141)
1967. Sloane, Norman G., 255 S. 17th St. (19103)
1929. Smith, Austin T., 330 S. 9th St. (7)
1964. Smith, Edgar C., 7100 Marshall Road, Upper Darby, Pa.
1955. Smith, J. Winslow, 3034 Darby Rd., Ardmore, Pa.
1967. Smith, Kaighn, Lankenau Medical Bldg. (19151)
1933. Smith, Lauren Howe, 111 N. 49th St. (39)
1952. Smith, Richard T., 330 S. 49th St. (7)
1967. Smith, Robert R., William H. Rorer, Inc., 500 Virginia Drive, Fort Washington, Pa. (19034)
1964. Smyth, Murray G., Jr., 1710 Delancey Place (19103)
1968. Snagg, William T., Cooper Hospital, Camden, N. J. (08103)
1951. Snape, William J., Cooper Hosp., Medical Arts Bldg., 5th Floor, 300 Stevens St., Camden, N. J. (08103)
1966. Snow, Laurence H., 3300 Henry Ave. (19129)
1953. Snyder, G. Gordon, Bryn Mawr Medical Bldg., Bryn Mawr, Pa.
1958. Sodeman, William A., 1030 E. Lancaster Ave., Rosemont, Pa. (19010)
1961. Soffe, Alvin M., 1930 Chestnut St. (3)
1935. Sokoloff, Martin J., 255 S. 17th St. (3)
1964. Soll, David B., 5001 Frankfort Ave. (19124)
1940. Soloff, Louis A., 3401 N. Broad St. (40)
1950. Somerville, William J., 37 S. 20th St. (3)
1944. Sommer, George N. J., Jr., 120 W. State St., Trenton, N. J.
1952. Sones, Maurice, Mt. Airy Medical Bldg. (19)
1951. Sonneborn, Duane G., 1200 W. Erie Ave. (24)
1928. *Spaeth, Edmund B., 1930 Chestnut St. (3)
1966. Spaeth, George L., 1930 Chestnut St. (19103)
1958. Spaeth, Philip G., 1930 Chestnut St. (3)

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* S. Weir Mitchell Associate

1937. Spangler, John Luther, Devon, Pa.
1957. Spelman, Joseph Worcester, Dept. of Public Health, 13th & Wood Sts. (7)
1935. Spiegel, Ernest A., 6807 Lawnton Ave. (26)
1961. *Spiegelman, Jay, Benson East Apt., Jenkintown, Pa.
1955. Spitz, Eugene B., 40–50 W. Front St., Media, Pa.
1958. Splendido, Joseph A., 608 W. Cliveden (19)
1961. Stahlgren, LeRoy H., Episcopal Hospital, Front & Lehigh Ave. (19125)
1960. Stainback, William C., Bryn Mawr Medical Bldg., Bryn Mawr, Pa.
1957. Stanley, Robert C. G., 2315 Edgemont Rd., Chester, Pa.
1968. Stapinski, Stanley M., 80 W. Main St., Glen Lyon, Pa. (18617)
1927. Starr, Isaac, 505 Cresheim Valley Rd. (18)
1952. Stauffer, Herbert M., 3401 N. Broad St. (40)
1952. Stayman, Joseph W., Jr., 8815 Germantown Ave. (18)
1945. Stecher, H. Armin, 1510 Darby Rd., Havertown, Pa.
1955. Steel, Howard H., 238 W. Allens Lane (19119)
1952. *Steiger, William A., 3401 N. Broad St. (40)
1964. Stein, Donald B., Jr., 3000 Robin Lane, Havertown, Pa. (19083)
1946. Stein, Irvin, 1936 Spruce St. (3)
1966. Stein, Joseph M., 414 Cooper St., Camden, N. J. (08102)
1953. Stein, Raymond O., 269 S. 19th St. (3)
1966. Stein, Samuel C., 1930 Chestnut St. (19103)
1936. Steinfield, Edward, 2200 Benjamin Franklin Parkway (30)
1968. Steinmetz, Charles G., III, 4606 Spruce St. (19139)
1951. Sterling, Julian A., 3505 S. Ocean Drive, Hollywood, Fla. (33020)
1948. Stevens, Lloyd W., 133 S. 36th St. (4)
1928. *Stokes, Joseph, Jr., Henry Phipps Institute, 4219 Chester Ave. (19104)
1943. Stokes, S. Emlen, 129 Chester Ave., Moorestown, N. J.
1967. Stool, Sylvan E., 1740 Bainbridge St. (19146)
1968. Storey, Patrick B., 1505 Race St. (19102)
1961. Strang, John E., 330 S. 9th St. (7)
1953. Strawbridge, Rendall R., Lankenau Medical Bldg. (19151)
1937. *Strumia, Max M., Penn Valley, Narberth, Pa.
1960. *Strumia, Paul V., Bryn Mawr Hospital, Bryn Mawr, Pa.
1967. Stunkard, Albert J., Univ. of Pennsylvania (19104)
1951. *Sturgis, Katherine Boucot, 349 Wister Rd., Wynnewood, Pa. (19096)
1927. Sturgis, Samuel Booth, 349 Wistar Rd., Wynnewood, Pa. (19096)
1966. Sullivan, Howard E., Jr., Bryn Mawr Medical Bldg., Bryn Mawr, Pa. (19010)
1930. Sunderman, F. William, 1833 Delancey Place (3)
1954. *Sussman, Marcel S., Wm. Penn House, 1919 Chestnut St. (19103)
1963. Sutliff, Frederick P., 3701 N. Broad St. (19140)
1965. Sutnick, Alton I., 2135 St. James Place (19103)
1965. Swartley, Robert N., 8815 Germantown Ave. (19118)
1968. Sweeney, Francis J., Jr., Jefferson Med. College (19107)
1952. Talbot, Timothy R., Jr., 204 Booth Lane, Haverford, Pa.
1963. Tassman, William S., 187 E. Evergreen Ave. (19118)
1946. Tauber, Robert, 2019 Walnut St. (3)
1952. Taylor, Ann Gray, 6364 Germantown Ave. (44)
1960. Taylor, Daniel B., 2241 Federal St. (46)
1965. Taylor, Richard C., 11th & Sansom Sts. (19107)
1969. Taylor, W. J. Russell, PGH, 34th and Curie Ave. (19104)
1956. Templeton, John Y., III, 1025 Walnut St. (19107)
1966. Teplick, Joseph G., 1351 W. Tabor Road (19141)
1966. Terry, Luther L., 121 College Hall, Univ. of Pennsylvania (19104)
1951. Theodos, Peter A., 1930 Chestnut St. (3)
1961. Therman, Per-Olof, 111 N. 49th St. (39)
1959. Thomas, Arthur H., 5240 Vine St. (39)

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* S. Weir Mitchell Associate

1946. Thomas, Carmen C., 1930 Chestnut St. (3)
1964. Thomas, John W., 5900 Spruce St. (19139)
1952. Thompson, Charles M., 255 S. 17th St. (3)
1927. Thorington, J. Monroe, Cambridge Apts., Wissahickon Ave. & School House Lane (44)
1967. Thorwarth, William T., 8835 Germantown Ave. (19118)
1954. Tindall, Dorothy D., 1930 Rittenhouse Sq. (3)
1966. Toland, Joseph J., N.E. Med. Center, Roosevelt Blvd. & Welsh Rd. (19114)
1935. Toland, Owen J., 336 Aubrey Rd., Wynnewood, Pa.
1952. *Tondreau, Roderick L., 523 Old Gulph Rd., Bryn Mawr, Pa.
1949. Tornay, Anthony S., 2038 Locust St. (3)
1966. Torrance, Edward G., 678 Burmont Rd., Drexel Hill, Pa.
1968. Tourtellotte, Charles D., 3400 N. Broad St. (19140)
1936. Towson, Charles Emory, 224 W. Washington Lane (44)
1955. Trimpi, Howard D., 501 N. 17th St., Allentown, Pa.
1954. Trommer, Philip R., 258 S. 18th St. (3)
1956. Troncelliti, Mario V., Pennsylvania Hospital (7)
1953. Tropea, Frank, Jr., 500 Mulberry Lane, Haverford, Pa.
1947. Trueman, Robert H., 2101 Chestnut St. (3)
1954. Truitt, R. Marshall, Jr., 6400 Wissahickon Ave. (19119)
1965. Tsaltas, Theodore T., 1025 Walnut St. (19107)
1966. Tucker, Gabriel F., Jr., 3401 N. Broad St. (19140)
1959. Tuddenham, William J., Pennsylvania Hospital (7)
1938. Tuft, Louis, 1530 Locust St. (2)
1964. Tulsky, Emanuel G., Abington Memorial Hospital, Abington, Pa. (19001)
1933. *Tumen, Henry J., 1830 Rittenhouse Square (3)
1938. Turman, Christopher M., 1245 Highland Ave., Abington, Pa. (19001)
1954. Turner, Linton W., 16 Bay Rd., Ocean City, N. J. (08226)
1959. Tyson, R. Robert, 3401 N. Broad St. (40)
1937. *Uhle, Charles A. W., Lankenau Medical Bldg. (19151)
1953. Ulin, Alexander W., 230 N. Broad St. (2)
1960. Urcchio, Joseph F., 245 N. Broad St. (7)
1950. Valdes-Dapena, Antonio, 214 Plush Mill Rd., Wallingford, Pa.
1958. Van den Noort, Gordon, 958 County Line Rd., Bryn Mawr, Pa. (19010)
1937. *Vander Veer, Joseph B., 330 S. 9th St. (7)
1937. Van Loon, Emily Lois, 255 S. 17th St. (3)
1960. Van Meter, Ralph H., 244 W. Main St., Moorestown, N. J.
1933. *Vastine, Jacob H., 2nd, 267 Kent Rd., Wynnewood, Pa.
1967. Vaughan, Victor C., III, 2600 N. Lawrence St. (19133)
1963. Vaughan, Arthur R., Jr., 5329 Rising Sun Ave. (19120)
1958. Velkoff, Cyril L., 2100 Walnut St. (3)
1965. Viggiano, Louis X., 301 Long Lane, Upper Darby, Pa.
1952. Vischer, Thomas J., 5903 Greene St. (44)
1940. Voegelin, Adrian W., Suite 108, 5735 Ridge Ave. (19128)
1960. Wagenheim, Harry H., 1822 Spruce St. (3)
1949. Wagner, Frederick B., Jr., 800 Chauncey Road, Narbeth, Pa.
1949. Wagner, Joseph A., 201 Highland Ave., Bryn Mawr, Pa.
1938. Waldman, Joseph, 404 Meadowbrook Lane (18)
1955. Waldron, Jerome M., Evergreen Towers, 8900 Roosevelt Blvd. (19115)
1967. Waltzer, Frederick N., York & Keith Rds., Abington, Pa. (19001)
1956. Watkins, E. Lloyd, 8811 Germantown Ave. (18)
1969. Waugh, Bascom S., 1882 S. 10th St., Camden, N. J. (08104)
1967. Wear, Roland F., Jr., Campbell Soup Co., 375 Memorial Ave., Camden, N. J. (08101)
1952. Weaver, Harry S., Jr., Room 405, 1930 Chestnut St. (19103)
1953. Weber, Lennard L., 829 Spruce St. (19107)
1969. Weibel, Robert E., 1001 Pennsylvania Ave., Havertown, Pa. (19083)
1952. Weinstein, George L., 255 S. 17th St. (3)
1950. Weiss, Sidney, 2037 Locust St. (3)

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* S. Weir Mitchell Associate

1965. Weiss, William, Philadelphia General Hospital, 34th & Curie Ave. (19104)
1959. Wellenbach, Burton L., 1930 Chestnut St. (19108)
1967. Weller, Russell W., Chester City Hosp., W. Chester, Pa. (19380)
1951. *Welty, Jack W., Montgomery Ave. & Owen Rd., Wynnewood, Pa.
1955. Wendkos, Martin H., Green Hill in Lower Merion (19151)
1962. Wentz, Clarkson, 20 S. Valley Road, Paoli, Pa.
1961. Wermuth, William C., 414 Minden Way, Wynnewood, Pa. (19096)
1959. West, Clifton F., Jr., 406 Lankenau Medical Bldg. (19151)
1960. Whiteley, William H., 1015 Chestnut St. (7)
1925. Widmann, Bernard P., 250 S. 18th St. (3)
1954. Wieder, Henry S., Jr., 829 Spruce St. (19107)
1939. *Willauer, George, 6129 Greene St. (44)
1969. Williams, James R., 5000 Woodland Ave. (19143)
1937. *Williams, John C., 6370 Germantown Ave. (44)
1965. Williams, Kirkley R., Bryn Mawr Medical Bldg., Bryn Mawr, Pa., (19010)
1968. Williams, Norman, Jefferson Med. College (19107)
1950. Williams, R. G., Univ. of Pa. School of Medicine (4)
1927. Williamson, Ernest G., 6353 Woodbine Ave. (19151)
1945. Wilson, John F., Fairmount Farm, 561 Fairthorne Ave. (19128)
1949. Wilson, William W., 133 S. 36th St. (4)
1957. Winkleman, N. William, Jr., 4141 Apalogen Rd. (44)
1963. Winston, Joseph M., Jeanes Hospital (11)
1966. Wise, John S., 433 Bellevue Ave., Trenton, N. J. (08618)
1961. Wise, Robert I., 1025 Walnut St. (7)
1968. Witkowski, Joseph A., 3501 Ryan Ave. (19136)
1953. Wohl, George T., Philadelphia General Hospital (4)
1933. Wohl, Michael G., 1727 Pine St. (3)
1958. Woldow, Irving, Einstein Med. Center, York & Tabor Rds. (19141)
1958. Wolf, John H., 124 W. Walnut Lane (44)
1944. Wolf, Lewes R., 3474 Frankford Ave. (34)
1962. Wolferth, Charles C., Jr., The Windsor, Suite 2307, 1700 Benj. Franklin Pkwy. (19103)
1964. Wolfson, Robert J., 3701 N. Broad St. (10140)
1964. *Wolgin, William, 1512 Spruce St. (19102)
1957. Wolkowicz, Michael I., 2022 Spruce St. (3)
1942. Wolman, Irving J., 7607 Woodlawn Ave. (26)
1966. Wood, Alfred C., Jr., 6386 Church Rd. (19151)
1932. *Wood, Francis C., 3400 Spruce St. (19104)
1944. Wood, H. Curtis, Jr., 7010 Lafayette Ave., Fort Washington, Pa.
1966. Wood, Margaret G., 3400 Spruce St. (19104)
1953. *Woodruff, Marston T., 4940 Penn St. (24)
1960. Wurzel, Harold A., 3400 Spruce St. (4)
1969. Yanoff, Myron, 3400 Spruce St. (19104)
1966. Yaskin, H. Edward, 589 Stevens St., Camden, N. J. (08103)
1964. Young, Alma L., 3343 W. Penn St. (12129)
1941. *Young, Barton R., Germantown Hospital (44)
1966. Young, Irving, Albert Einstein Medical Center, N.D. (19141)
1967. Zakreski, Matthew J., 8815 Germantown Ave. (19118)
1961. Zanni, Anthony L., 111 N. 49th St. (39)
1957. Zaslow, Jerry, 6735 Harbison Ave. (19149)
1955. Zatuchini, Jacob, 3401 N. Broad St. (40)
1946. Zeigerman, Joseph H., 2105 Spruce St. (3)
1968. Zimskind, Paul D., Jefferson Med. College (19107)
1949. Zintl, William J., 1016 Warrior Rd., Drexel Hill, Pa. (19026)
1956. Ziserman, Abraham J., 2046 Pine St. (3)
1962. Zubrow, Sidney N., 829 Spruce St. (10107)
1933. Zulick, J. Donald, 307 Fisher Rd., Jenkintown, Pa. (19046)
1965. Zweiman, Burton, Univ. of Pa. Hospital (19104)

---

* S. Weir Mitchell Associate

Non-Resident Fellows

ELECTED

1936. Alexander, Fay K., Lincolnville, Maine
1953. Allman, David B., 4105 Brigantine Blvd., Brigantine, N. J. (08203)
1941. Aronson, Roland S., 9401 Byeforde Road, Kensington, Md. (20795)
1954. Austin, George M., Loma Linda Univ. Med. Sch. Hosp., Loma Linda, Calif. (92354)
1942. Bachman, Carl, 1337 Andrea Ave., St. Helena, Cal. (93574)
1960. Bacon, Catherine L., 88 Gardiner Rd., Woods Hole, Mass. (02543)
1958. Ballinger, Walter F., II, Washington Univ. Sch. of Med., 4960 Audubon Ave., St. Louis, Mo. (63110)
1966. Baue, Arthur E., The Jewish Hosp. of St. Louis, 216 S. Kingshighway, St. Louis, Mo. (63110)
1955. Beckfield, William J., Luther Hospital, 310 Chestnut St., Eau Claire, Wisconsin
1949. *Beecham, Clayton T., Geisinger Medical Center, Danville, Pa.
1932. Behnel, Charles A., P. O. Box 4256, San Jose Branch, Bisbee, Arizona.
1955. Blank, Harvey, Jackson Memorial Hospital, Miami 36, Fla.
1921. Borzell, Francis F., R. D. 4, Box 4310, Browns Mills, N. J. (08015)
1937. Braceland, Francis J., The Institute of Living, 200 Retreat Ave., Hartford, Conn.
1951. Brinton, S. Jervis, 3 Gulf View Rd., Palm Beach, Fla. (33482)
1948.**Brown, Robert B., mc, usn, U. S. Naval Hospital, Bethesda, Md.
1959. Browneller, Ellsworth R., Geisinger Medical Center, Danville, Pa.
1953. Burbridge, J. Raymond, 163 Nassau St., Princeton, N. J.
1952. Bumgardner, Heath D., 13 S. Main St., Cape May Court House, N. J.
1931. Cantarow, Abraham, Dept. of Health, Education & Welfare, NIH, Bethesda, Md. (20014)
1948. Chapman, John P., Calle Fray Junipero Serra 26, Palma de Mallorca, Balearic Islands, Spain.
1950. Chapple, Charles C., 8517 Indian Hills Drive, Omaha, Neb. (68114)
1941. Cheleden, John, 1012 Volusia Ave., Daytona Beach, Fla.
1930. Clarke, Francis Mann, 116 New St., New Brunswick, N. J.
1926. Clerf, Louis H., 5575-8th Ave., North St. Petersburg, Fla.
1964. Cohen, Sheldon G., 309 S. Franklin St., Wilkes-Barre, Pa.
1959.**Cowan, RADM. John S., mc, usn, Pacific Fleet Surgeon, Hdq., U.S. Pacific Fleet, FPO, San Francisco, Calif. (96601)
1960. Cowley, Allen W., Sr., 1919 N. Front St., Harrisburg, Pa.
1947. Cutler, Norman L., 1300 Harrison St., Wilmington, Del.
1941.**Cuttle, Tracy D., U. S. Naval Hospital, Chelsea, Mass (02150)
1959. Dannenberg, Arthur M., Jr., Johns Hopkins School of Hygiene, 615 N. Wolfe St., Baltimore, Md. (21205)
1937. Davis, Perk Lee, R. D. 5, Turkey Hollow Farm, Waynesburg, Pa. (15370)
1954. Deitrick, John E., Cornell Univ. Medical College, 1300 York Ave., New York 21, N. Y.
1965. Delaney, William E., III, St. Vincent's Hosp., 170 W. 12th St., N.Y.C. (10011)
1941. Dixon, Harold M., 4805 46th St., N.W., Washington 16, D. C.
1961. Duane, Thomas D., 35 E. Elizabeth Ave., Bethlehem, Pa.
1959. Durgin, Bernice Elise, 221 N. Allegheny St., Bellefont, Pa.
1947. Durkin, John K., V.A. Hospital, Coatesville, Pa. (19320)
1964. Eckenhoff, James E., Northwestern Univ. Medical School, Chicago, Ill. (60611)
1955. Edwards, Margaret Hay, 800 4th St., S.W., Washington 24, D. C.
1953. Eisenberg, Isadore J., 2806 Green St., Harrisburg, Pa.
1951. Ellis, Mackinnon, Mountain Home V.A. Hosp., Johnson City, Tenn. (37601)
1957.**Errion, Arthur Robbins, U. S. Naval Hospital, Fleet Post Office, San Francisco, Cal. (96662)

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* S. Weir Mitchell Associate

** Military Service

1951. Ervin, Carl E., 240 North Third Street, Harrisburg, Pa.
1944. Estes, W. L., Jr., 35 E. Elizabeth Ave., Bethlehem, Pa.
1954. Evans, Harry D., Jr., 104 Cape Charles Drive, Pelham Estates, Greenville, S. C. (29607)
1952. Faller, Constantine P., 127 State St., Harrisburg, Pa.
1952. Flinn, Lewis B., 1306 Broom St., Wilmington 6, Del.
1940. Forrester, James S., Harrisburg Polyclinic Hospital, Harrisburg, Pa.
1940. Fry, Kenneth E., Clinton Court Apts., Walla Walla, Washington (99362)
1947. Gaskill, Herbert S., 9648 E. Powers Drive, Englewood, Colo.
1957. Giering, John Fleming, 84 James St., Kingston, Pa.
1931. Gilman, Robert Louis, Cheyney, Pa.
1968. Glenney, Wilton R., 218 W. Market St., Pottsville, Pa. (17901)
1954. Godfrey, Ellwood W., Princeton Hospital, Princeton, N. J.
1928. Gordon, Burgess L., 1550 Lake Shore Dr., Chicago, Illinois
1952. Grieco, Reynold M., 2 W. 4th St., Williamsport, Pa.
1934. Griffith, John Q., Jr., 6 North Fredericksburg Ave., Margate, N. J.
1952. Gross, Elmer R., Medical Arts Bldg., Wilmington, Del.
1933. Gruber, Charles M., 1313 College Ave., Redlands, Calif.
1951. Hafkenschiel, Joseph H., Jr., 380 Golden Oak Drive, Portola Valley, Calif. (94025)
1935. Haines, Harlan F., 231 N. Pine St., Seaford, Del.
1939. Hamblock, Leonard C., Masonic Homes, Elizabethtown, Pa. (17022)
1959. Hampton, Louis J., 300 Highland Ave., Hanover, Pa. (17331)
1969. Hanson, Stephen M., Coatesville Hosp., Coatesville, Pa. (19320)
1955. Harris, John H., 1301-A N, Second St., Harrisburg, Pa.
1965. Harris, John H., Jr., Carlisle Hospital, Carlisle, Pa. (17013)
1936. Hatch, Lerleen Clement, 1642 Saddle Hill Drive, Logan, Utah
1928. Hayman, Joseph M., Jr., 3504 E. Scarborough Rd., Cleveland Hts., Ohio (44118)
1946. Hendrickson, Frank O., Jupiter, Fla.
1955. Hills, Arthur G., 1000 N. W. 17th St., Miami, Fla. (36)
1933. Hitzrot, Lewis H., 161 Patton Ave., Princeton, N. J. (08540)
1910. Horn, Robert C., Henry Ford Hospital, Detroit, Mich.
1953. Imber, Irving, 428 Walnut St., Reading, Pa.
1958. Impink, Robert R., 405 Oley St., Reading, Pa.
1935. Ingleby, Helen, The Church House, Heacham, King's Lynn, England
1921. •Ivy, Robert H., 104 Dalton Rd., Paoli, Pa.
1960. Jenson, William K., Joslin Clinic, 15 Joslin Rd., Boston, Mass. (02215)
1952. Jonas, Karl C., 916 19th St., N.W., Washington, D.C. (20006)
1955. •Jordan, Charlotte B., 175 E. Brown St., E. Stroudsburg, Pa.
1955. Jordan, Claus G., 175 E. Brown St., E. Stroudsburg, Pa.
1936. Kain, Thomas M., 30 Northeast 97th St., Miami, Fla.
1956. Keffer, William H., 413 Oley St., Reading, Pa.
1947. Kelchner, Clyde H., 1125 Turner St., Allentown, Pa.
1965. Kennedy, Charles, 5115 Allan Terrace, Bethesda, Md. (20016)
1954. LaMotte, William O., Jr., 1303 Delaware Ave., Wilmington, Del. (19806)
1963. Lang, Leonard P., 1009 Park Place, Wilmington, Del. (19806)
1936. Leaman, William G., Jr., P. O. Box 463, Unionville, Pa. (19375)
1943. Leopold, Irving H., The Mount Sinai Hospital, 100th St. & 5th Ave., New York, N. Y. (10029)
1952. Levan, John B., 401 Oley St., Reading, Pa.
1960. Lewis, David H., Hogenskildsgatan 13, S-416, 57 Goteborg, Sweden
1949. Lhamon, William T., The New York Hospital, 525 E. 68th St., New York, N. Y. (10021)
1954. Light, John J. B., 25 N. 9th St., Lebanon, Pa.
1954. Lindenmuth, Woodrow W., V.A. Hospital, West Haven, Conn.
1948. Livingood, Clarence S., Henry Ford Hospital, Detroit 2, Mich.

• S. Weir Mitchell Associate

1932. *Lukens, Francis D. W., Veterans Administration Hospital, University Drive, Pittsburgh, Pa. (15240)
1965. McCarty, Daniel J., Jr., University of Chicago, Chicago, Ill. (60637)
1962. McGregor, Robert A., The Professional Bldg., Augustine Cut-Off, Wilmington 3, Del.
1948. McLaughlin, John T., 655 N. Central Ave., Glendale, Calif.
1967. Magee, Joseph H., Box 294, Cold Spring Harbor, N.Y. (11728)
1942. Manges, Lewis C., Jr., R. D. 2, Windsor, N.Y. (13865)
1959. Maniglia, Rosario, Holy Spirit Hospital, Camp Hill, Pa.
1953. Margolies, Michael, 567 E. Chestnut St., Coatesville, Pa.
1955. Margolies, M. Price, 379 E. Chestnut St., Coatesville, Pa.
1935. Mason, James B., 1730 S. Jackson St., Tacima, Washington
1932. Meade, Richard H., Jr., 750 San Jose Dr., Grand Rapids, Mich.
1936. Middleton, William Shainline, 2114 Adams St., Madison, Wisc.
1946. Miller, Franklin R., Snyder-Jones Clinic, First Nat. Bk. Bldg., Winfield, Kansas
1949. Motley, Hurley L., 1212 Shatto St., Los Angeles, Calif.
1960. Ojers, Gaylord W., 35 E. Elizabeth Ave., Bethlehem, Pa.
1956. Oppenheimer, Albert, 224 E. Main St., Moorestown, N. J.
1926. Paul, John Rodman, 333 Cedar St., New Haven, Conn.
1959. Pendergrass, Henry P., Massachusetts General Hospital, Boston, Mass.
1950. Pincus, Irwin J., 610 N. Roxbury Drive, Beverly Hills, Calif.
1958. Rachlin, Lillian, 370 Golden Oak Drive, Portola Valley, Calif. (94026)
1966. Rahn, Elsa Kertesz, 363 Hempstead Ave., Rockville Center, N. Y. (11570)
1938. Read, Hilton S., 5407 Atlantic Ave., Atlantic City, N. J.
1964. Reed, Miriam, 253 Witherspoon St., Princeton, N. J.
1958. Reinhardt, David J., III, 400 Bay Ave., Lewes, Del. (19958)
1936. Reisinger, John A., 1835 Eye St., N.W., Washington, D. C.
1955. Rettew, Philip L., 612 Museum Rd., Reading, Pa.
1951. Richardson, Fred MacD., South Side, Route 23, Claverack, N. Y. (12513)
1961. Richardson, Herschell E., 205 Mayerline St., Houston, Texas
1947. Rogers, Arthur Merriam, 1351 Durwood Drive, Charlotte, N. C.
1965. Rowe, Daniel S., 20 Horseshoe Lane, Madison, Conn. (06443)
1941. Royster, Hubert A., Jr., Watts Hospital, Durham, N. C. (27705)
1954. Sampson, Martin C., Wallace Laboratories, Cranbury, N. J.
1936. Sands, Joseph Evans, 135 107th St., Stone Harbor, N. J.
1945. Schell, James F., 506 Sharpley Lane, Wilmington, Del.
1958. Schreck, Kenneth M., 1403 Dauphin Ave., Wyomissing, Pa. (19610)
1963. Schumacher, L. Richard, 60 E. Court St., Doylestown, Pa. (18901)
1921. Schumann, Edward A., 4141 Jackson Drive, Lafayette Hill, Pa.
1951. Seitchik, Joseph, Sinai Hospital of Baltimore, Baltimore, Md.
1941. Shands, Alfred R., Jr., Alfred I. duPont Institute, P.O. Box 269, Wilmington, Del. (19899)
1964. Sharpe, William D., New Jersey College of Medicine, Jersey City 4, N. J.
1950. Shiffer, Paul H., Dreher Ave., R.D. #2, Stroudsburg, Pa.
1951. Shorey, Winston K., 7117 Shamrock Drive, Little Rock, Arkansas
1933. Smelzer, Donald C., 207 E. Orange St., Lancaster, Pa.
1954. Smith, Charles W., 128 State St., Harrisburg, Pa.
1942. Stengel, Alfred, Jr., Maple Ave., Katonah, N. Y.
1955. Stevenson, Theodore D., 475 Riverside Drive, New York, N. Y. (10027)
1931. Stiles, Merritt H., E. 406 14th Ave., Spokane 3, Wash.
1953. Stroud, M. W., Shaker Blvd., Shagrin Falls, Ohio (44022)
1934. Summey, Thomas J., Morrowdale Farm, Rt. 2, Charlottesville, Pa.
1961. Sunderman, F. William, Jr., Univ. of Conn. Sch. of Med., 2 Holcomb St., Hartford, Conn. (06112)
1952. Sweeney, Francis X., Station A, Marlboro, N. J. (07746)
1931. Taylor, Norman H., Queen of the East, E. Broadway, Hamilton, Bermuda
1928. Thomas, J. Earl, Loma Linda University, Loma Linda, Calif.

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* S. Weir Mitchell Associate

1942. Thompson, Wesley D., 247 E. 3rd St., Lewistown, Pa.
1941. Tompkins, Pendleton, 490 Post St., San Francisco, Calif.
1897. Veasey, Clarence A., 1118 W. 9th Ave., Spokane 9, Wash.
1941. Weaver, Ruth H., 108 Atlantic Ave., Atlantic City, N. J.
1957. Webster, Marie, 1623 Hyde St., San Francisco 9, California
1966. Wentzler, J. Donald, R.D. #2, Muncy, Pa. (17756)
1959. Whayne, Tom F., University of Kentucky Medical Center, Lexington, Ky.
1966. White, Richard K., 1702 Walnut St., Allentown, Pa. (18104)
1936. Wilder, Theodore S., Linden Lane, Sherborn, Mass.
1935. Willard, John H., Harlan Memorial Hospital, Harlan, Kentucky
1920. Williams, Philip F., 410 Mayflower Rd., Lake Forest, Ill. (60045)
1949. Willson, J. Robert, University of Michigan Medical Center, Ann Arbor, Michigan (48104)
1948. Winston, Julius, 1616 Pacific Ave., Atlantic City, N. J. (08400)
1963. Wood, Horatio C., IV, Cincinnati General Hospital, Cincinnati, Ohio.
1953. Zarafonetis, Chris J. D., Simpson Memorial Institute, University of Michigan, Ann Arbor, Michigan

Honorary Fellows

Limited to fifty, of whom twenty may be foreigners.

American

ELECTED

1967. Bell, Whitfield J., Jr., ph.d., litt.d(hon.), ll.d.(hon.), American Philosophical Society, Independence Square (19106)
1964. Corner, George Washington, m.d., sc.d.(hon.), ll.d.(hon.), litt.d.(hon.), 1810 Rittenhouse Square (3)
1959. Fay, Marion S., m.a., ph.d., s.cd.(hon.), ll.d.(hon.), Women's Medical College, Henry Ave. & Abbottsford Rd. (29)
1965. Gurin, Samuel, ph.d., sc.d.(hon.), University of Pennsylvania School of Medicine, 36th and Hamilton Walk (19104)
1958. *Shryock, Richard H., ph.d., ll.d.(hon.), American Philosophical Society, Independence Square (6)

Foreign

1955. Mann, Ida, m.a., d.sc., m.b., b.s., l.r.c.p., d.o.m.s., f.r.c.s., Ophthalmic Consultant to the Government of W. Australia, 56 Hobbs St., Nedlands, Perth, W. Australia.

Honorary Associate Fellows

1955. Diemand, John A., President, Insurance Company of North America, 1600 Arch St. (2)
1964. Pew, J. Howard, Grays Lane & Mill Creek Rd., Ardmore, Pa.
1967. Rosenwald, Lessing, J., 1146 Fox Chase Rd., Jenkintown, Pa. (19046)
1967. Wintersteen, Mrs. John, 1425 Mt. Pleasant Rd., Villanova, Pa. (19085)

Necrological List

Resident Fellows	*Date of Election*	*Date of Death*
Appleman, Leighton F.	June 5, 1905	November 25, 1968
Bond, Earl D.	October 1923	October 21, 1968
Bostwick, Delazon S.	January 6, 1936	November 27, 1968
Cianfrani, Theodore	October 3, 1945	November 3, 1968

*S. Weir Mitchell Associate

Cloud, J. Howard	October 1910	April 27, 1968
Crosley, Archer P. Jr.	April 3, 1963	August 21, 1968
Daugherty, Earl A.	February 7, 1951	June 28, 1968
Daugherty, J. Arthur	February 2, 1955	August 28, 1968
Davis, John E.	October 2, 1957	May 2, 1968
Donnelly, Andrew J.	January 9, 1946	November 7, 1968
Eaton, Francis H.	October 13, 1948	September 23, 1968
Ferguson, L. Kraeer	January 7, 1935	April 7, 1968
Flippin, H. F.	March 1, 1939	November 21, 1968
Goluboff, Bernard	December 4, 1963	April 12, 1968
Harer, William B.	February 6, 1952	October 11, 1968
Hart, Alonzo W.	May 20, 1964	September 27, 1968
Jaeger, (James) Rudolph	October 1, 1947	August 15, 1968
Krewson, William E.	January 6, 1941	May 2, 1968
Maeder, Leroy M. A.	October 2, 1935	April 15, 1968
Miller, Ford A.	October 2, 1935	December 5, 1968
Parish, Benjamin D., Sr.	November 3, 1909	March 29, 1968
Reimann, Stanley P.	October 1, 1919	February 21, 1968
Rhoads, S. Creadick	November 4, 1964	April 10, 1968
Riggs, Helena E.	January 7, 1942	October 7, 1968
Rudolphy, J. E.	January 9, 1933	February 25, 1968
Sharp, Reuben L.	October 4, 1950	October 17, 1968
Shipman, J. S.	January 6, 1936	January 3, 1969
Turner, Creighton H.	October 3, 1923	March 29, 1968
Whitaker, William	June 7, 1921	April 21, 1968

Non-Resident Fellows	*Date of Election*	*Date of Death*
Harris, Stanley E.	January 11, 1932	March 1, 1968
Mulholland, Stanford W.	January 4, 1949	June 27, 1968

Honorary Foreign	*Date of Election*	*Date of Death*
Dale, Sir Henry Hallett	May 10, 1937	July 22, 1968

(*Suggested Form of Bequest*)

I hereby give, devise, and bequeath to The College of Physicians of Philadelphia, a charitable educational association organized under the laws of the Commonwealth of Pennsylvania and the executive offices whereof are located in the City of Philadelphia, the sum of.....

a. which sum shall be used for the general purposes of said association;

b. which sum shall be added to and become a part of the general endowment fund of said association;

c. which sum shall be used by said association preferably for the following purposes:

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